

ACCELL[®]/SQL: **Developing an Application**

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About This Manual

This manual is one of a set that describes the ACCELL/SQL application development system. An overview of the complete manual set is illustrated on the opposite page. This manual, *ACCELL/SQL: Developing an Application*, provides a conceptual overview of the ACCELL/SQL application development product and outlines the basic steps for developing an application. At each step you are directed to the appropriate manual in the documentation set for detailed instructions.

Using This Manual

This manual is intended primarily for the application developer. Throughout this manual, the word *you* refers to the application developer. The word *user* refers to any person who will be using your completed ACCELL/SQL application.

Prerequisite Experience

The ACCELL/SQL application development software is a programming tool intended for professional software developers. As a basis for understanding and using ACCELL/SQL, you must already be familiar with the following subjects or technologies:

- fundamental data-processing concepts
- one of the supported relational database management systems: Unify DataServer, INFORMIX, INGRES, ORACLE, or SYBASE SQL Server
- SQL (standard query language) concepts and syntax
- operating system interface and file structures
- the C programming language (optional)

Before You Start

Before getting started with this manual, read and follow the instructions given for installing and configuring ACCELL/SQL, as described in the following manuals:

Installing ACCELL/SQL
ACCELL/SQL: Setting Up a User Environment

If you have used previous releases of ACCELL/SQL, read about new features and changes in the following manuals:

ACCELL/SQL: Release 2 Features and Changes

ACCELL/SQL: Converting Release 1 Applications to Release 2

User Interfaces

This manual describes the steps for developing character mode applications. For additional information about how to create applications in a graphical presentation mode, use this manual with the following manual:

ACCELL/SQL: Developing an Application for a Graphical User Interface

Relational Database Management Systems

In some cases, ACCELL/SQL works differently depending on the relational database management system (RDBMS) that is used with it. For additional information about how ACCELL/SQL interacts with the RDBMS, see the following manual:

ACCELL/SQL: RDBMS Integration

For information about how to create form scripts that can be adapted to any type of RDBMS, see *ACCELL/SQL: Portability Guidelines*.

Required Manuals

To develop an application, this manual directs you to detailed instructions given in the following manuals:

ACCELL/SQL: Using an Application

ACCELL/SQL: Creating Screen Forms

ACCELL/SQL: Writing Form Scripts

ACCELL/SQL: Script and Function Reference

Tutorials

Before starting application development, you can experiment with ACCELL/SQL and learn its major features by using one or both of the ACCELL/SQL tutorial packages:

ACCELL/SQL: Developer's Tutorial

This manual describes the tutorial included with your ACCELL/SQL release. The tutorial teaches you how to develop a sample application by using the ACCELL/SQL application development toolset.

ACCELL/SQL Tutor 4GL Made Easy

These optional tutorial packages, available separately, are computer-based training (CBT) courses that provide online practice exercises. Each includes a printed job aid booklet. This form of instruction is optimal for fast training in the workplace, before ACCELL/SQL is installed.

Syntax Conventions

This manual uses the following syntax conventions to describe ACCELL/SQL statements and functions:

- ◎ Intersecting circles indicate that the statement has capabilities that are dependent upon a particular operating system, user interface, or RDBMS. For information about RDBMS-related extensions or conditions and restrictions, see *ACCELL/SQL: RDBMS Integration*. For information about graphical user interface dependencies, see *ACCELL/SQL: Developing an Application for a Graphical User Interface*.
- boldface** **Boldface** words are literal strings that you must type exactly as shown.
- italic words* *Italic* words indicate arguments, variables, numbers, or expressions that you must provide. Examples are table names, column names, and constants. Titles of manuals are shown in italics, for example, *ACCELL/SQL: Creating Screen Forms*.

UPPERCASE Boldface **UPPERCASE** words in syntax descriptions are ACCELL/SQL reserved keywords. ACCELL/SQL keywords are not case sensitive: you can type either uppercase or lowercase letters.

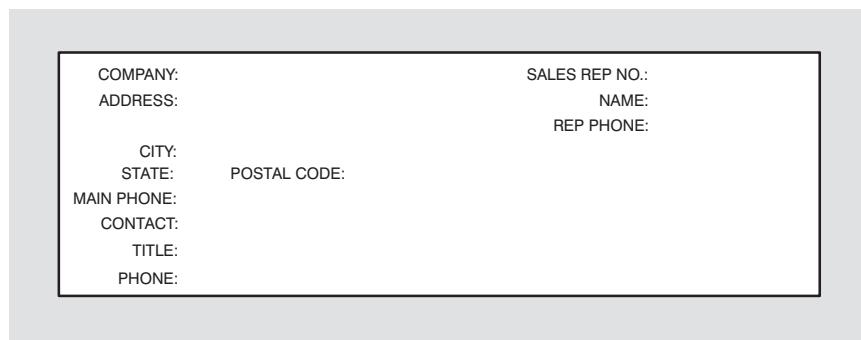
UPPERCASE Italic *UPPERCASE* words represent ACCELL/SQL configuration variables.

UPPERCASE Other **UPPERCASE** words represent ACCELL/SQL data types, such as FLOAT and TEXT.

“Title” Chapter and section titles are enclosed by a pair of quotation marks.

Screen Displays

Forms, prompts, and other information that appear on your terminal screen are represented in a screen outline:



Commands

Words that appear in bold, italic, sans-serif typeface indicate ACCELL/SQL commands that the user can execute from the keyboard, for example:

Press **PREVIOUS FORM**.

The specific keys vary depending upon the user’s terminal and the system configuration. Because of the flexibility of ACCELL/SQL, you can assign commands to different function keys, for instance, **F9**. Some commands can be executed by using escape sequences or control keys. For information about configuring ACCELL/SQL commands, see *ACCELL/SQL: Setting Up a User Environment*.

Features of This Manual

This manual contains specially marked paragraphs containing noteworthy information:



Tip

A *tip* contains a suggested action or other helpful information. ■



Warning

A *warning* cautions against an action that could cause data loss or damage to the database. ■



Additional Help

Additional Help tells you where to find more information about the described topics. ■

Additional Resources

The ACCELL/SQL development system assumes that you are familiar with database, SQL, and other computing concepts. The following publications contain information that is helpful for understanding other components of your application.

SQL (Standard Query Language)

American National Standards Institute. *Database Language SQL2*. July 1990, ISO working draft. ANSI X3H2-90-264.

VMS Operating System

Digital Equipment Corporation. *VMS User's Manual*. Maynard, Mass.: Digital Equipment Corp., 1989. Order number AA-LA98B-TE.

UNIX Operating System

Sobell, Mark G. *A Practical Guide to the UNIX System*. 2nd ed. Redwood City, Calif.: Benjamin/Cummings, 1989.

Graphical User Interfaces

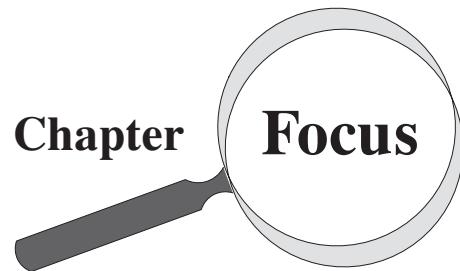
Nye, Adrian, and Tim O'Reilly. *X Toolkit Intrinsics Programming Manual for Version 11 of the X Window System*. Volume 4 of the X Window System series. Sebastopol, Calif.: O'Reilly & Associates, 1990.

OSF/Motif Programmer's Reference: Quest Motif Environment. Santa Clara, Calif.: Quest Systems Corporation, 1991.

Quercia, Valerie, and Tim O'Reilly. *X Window System User's Guide for X11 R3 and R4*. Volume 3 of the X Window System series. Sebastopol, Calif.: O'Reilly & Associates, 1990.

X Toolkit Intrinsics Reference Manual for X Version 11. Edited by Tim O'Reilly. Volume 5 of X Window System series. Sebastopol, Calif.: O'Reilly & Associates, 1990.

Getting Started

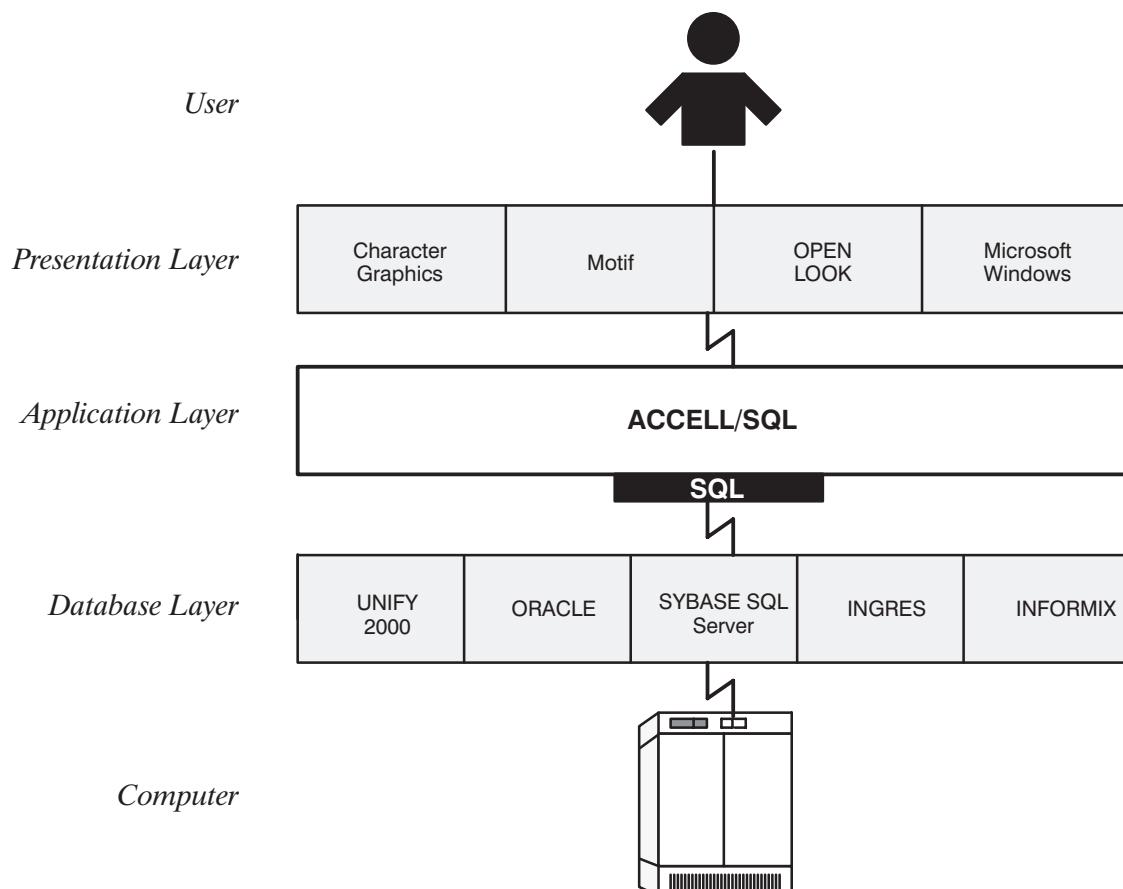


This chapter introduces the ACCELL/SQL application development software:

- features and components of ACCELL/SQL
- application components
- application development steps
- application implementation

What Is ACCELL/SQL?

ACCELL/SQL is an open systems applications development toolset that is compatible with the leading database management systems. The power of ACCELL/SQL enables you to create an application that will be compatible with a variety of user interfaces, databases, operating systems, and computers.



Whether you use the Unify DataServer RDBMS, ORACLE, INFORMIX, or SYBASE SQL Server, INGRES RDBMS, ACCELL/SQL is compatible with each RDBMS environment. In addition, ACCELL/SQL gives you the flexibility to run a single application with a variety of character and graphical user interfaces—with no additional programming.

ACCELL/SQL is the only application development system that combines all the development features you need in one fast and easy-to-use, integrated system.

User Features

For both developers and end users, ACCELL/SQL provides easy-to-use, fill-in-the-blank forms. Commands can be executed by pressing function keys or clicking a mouse button. There's no need to learn complex command-line syntax.

ACCELL/SQL commands are tailored to the tasks that users need to perform, such as searching for information or editing records. For example, users can execute commands such as these:

- **FIND**
- **NEXT RECORD**
- **DELETE RECORD**

Because ACCELL/SQL is itself an application, you use a similar set of commands for creating your application.

Development Features

For developing applications, ACCELL/SQL provides many features and advantages, for example:

- SQL-based architecture
- forms generator
- pop-up forms and menus
- data transfer between forms
- high-level, event-driven fourth-generation language (4GL)
- global and local functions
- one-dimensional and two-dimensional arrays
- comprehensive data types
- C-language interface
- compatibility with graphical user interfaces

Toolset Components

The ACCELL/SQL toolset consists of several components that together provide an integrated development system:

- ACCELL/Environment
- ACCELL/Generator
- ACCELL/4GL
- ACCELL/Manager
- ACCELL/Report Writer
- ACCELL/Menu Handler

Optional, add-on products are also available for adapting applications to special environments. These products can be purchased separately as needed:

- ACCELL/SQL Interactive Debugger
- ACCELL/TP

Each of these components is briefly described below.

ACCELL/Environment

ACCELL/Environment consists of the forms and menus used to access ACCELL/SQL components. ACCELL/Environment enables you to design ACCELL/Generator screen forms, edit ACCELL/4GL form scripts, and compile and run applications—all in one environment.

To speed development, ACCELL/Environment uses the same commands and interface used for end-user applications.

ACCELL/Environment also manages and processes your files automatically so that you can concentrate on developing your application. ACCELL/Environment includes a source management database to ease maintenance of applications.

This manual, *ACCELL/SQL: Developing an Application*, provides complete instructions for using ACCELL/Environment. Use this manual as your guide to the development process.

ACCELL/Generator

ACCELL/Generator enables you to create a form-based user interface interactively. It is a completely visual tool, allowing you to see each form as you create it.

When creating forms, you design the forms right on the screen, easily changing their size, shape, and location, as well as specifying borders. You can overlap forms, place them anywhere on the screen, and describe the flow between the forms.

For a complete description of the ACCELL/Generator component, see *ACCELL/SQL: Creating Screen Forms*.

ACCELL/4GL

ACCELL/4GL is a comprehensive fourth-generation language (4GL). The ACCELL/4GL is a readable, English-like language with an easily learned core of event-driven statements, plus the power of embedded procedural statements.

Using ACCELL/4GL, you can easily add sophisticated control logic and computational power to applications. You merely write a few lines of high-level ACCELL/4GL commands to supplement the forms you created with ACCELL/Generator.

For information about how to use ACCELL/4GL, see *ACCELL/SQL: Writing Form Scripts*.

ACCELL/Manager

ACCELL/Manager is the ACCELL/SQL runtime component. ACCELL/Manager serves as a link between the end-user running the application, the compiled screen forms and scripts that make up the application, and the database used by the application. ACCELL/Manager provides easy keyboard commands that both application end-users and developers can use to perform a variety of business tasks.

ACCELL/Manager provides these features:

- database searching
- database updates
- field-editing commands
- cursor movement commands
- display of database rows
- online help

Before you begin application development, become familiar with the commands and other features of ACCELL/Manager.

For a complete description of the ACCELL/Manager component, see *ACCELL/SQL: Using an Application*.

ACCELL/Report Writer

ACCELL/Report Writer enables you to generate reports for ACCELL/SQL applications. Using ACCELL/Report Writer, you can quickly and easily define a format for multiple-level, tabular reports.

ACCELL/Report Writer offers total control and flexibility over report generation. ACCELL/Report Writer uses a nonprocedural, English-based language that enables you to select the placement and format of columns, headings, footer information, column titles, and pagination.

For complete information about how to create reports, see *ACCELL/SQL: Creating Reports With RPT Report Writer*.

ACCELL/Menu Handler

The ACCELL/Menu Handler component is an interactive, menu-driven environment in which you can generate a menu system to develop a project, create an application, and run the completed application.

For information about how to create menus for your application, see *ACCELL/SQL: Localizing an Application*.

ACCELL/SQL Interactive Debugger

The ACCELL/SQL Interactive Debugger product is an optional component that enables you to interact with your running ACCELL/SQL application at the source code level. The Debugger helps you quickly detect and correct errors in ACCELL/4GL form scripts and allows you to start and stop the program at specific points, isolate bugs, view or change variable values, change or test code, and so on.

For additional product and purchase information about the Debugger option, contact your Unify sales representative.

ACCELL/TP

The ACCELL/TP component is an optional product for developing distributed online transaction-processing (OLTP) business applications. Using a transaction manager and a graphical user interface, ACCELL/TP provides many features and advantages, for example:

- distributed processing capabilities
- access to one or more global databases
- heterogeneous RDBMS support
- support for heterogeneous hardware platforms
- local database support
- centralized administration

For additional product and purchase information about ACCELL/TP, contact your Unify sales representative.

Portability

Because ACCELL/SQL is an open systems toolset, you can create an application that is compatible with more than one RDBMS, user interface, or operating system. In addition, ACCELL/SQL features have been optimized to accommodate the special features of each production environment.

If you are designing your application for a mixed environment, you can set configuration variables and write form scripts that are customized to each environment.



Additional Help

For information about how to create portable applications, see *ACCELL/SQL: Portability Guidelines*. ■

Databases

The ACCELL/SQL application development system is compatible with SQL-based relational database management systems such as these:

- Unify DataServer
- INFORMIX
- INGRES
- ORACLE
- SYBASE SQL Server



Additional Help

For information about how to optimize your application for the RDBMS, see *ACCELL/SQL: RDBMS Integration*. ■

User Interfaces

ACCELL/SQL can be executed in any of three user interface options (or *presentation modes*):

Character UI option	By default, application screen forms are compatible with standard ASCII terminals.
Microsoft Windows	When using this UI option, ACCELL/Manager executes your application in a window and uses Windows user interface features.
Motif UI option	When using this UI option, ACCELL/SQL is executed in an X Window-based graphical user interface (GUI) that enables users to run applications in a Motif environment.
OPEN LOOK UI option	When using this UI option, ACCELL/SQL is executed in an X Window-based graphical user interface (GUI) that enables users to run applications in an OPEN LOOK environment.



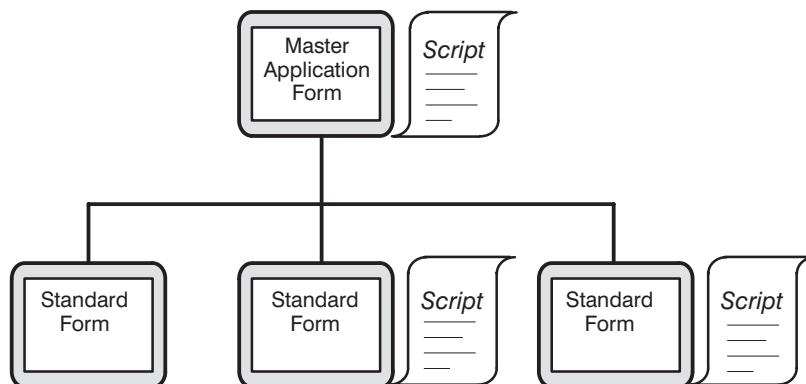
Additional Help

For information about how to optimize your application for a graphical user interface, see *ACCELL/SQL: Developing an Application for a Graphical User Interface*. ■

What Is an Application?

An *application* is a software solution to a real-world business problem. An ACCELL/SQL application is a set of forms and associated ACCELL/4GL form scripts that is custom-designed to fulfill a specific need. For example, an application can be used to enter sales orders, manage parts inventories, catalog library acquisitions, schedule appointments, and so on.

The following illustration represents a simple application. The application begins with a master application form. From a menu on the master application form, the user can choose any of three other forms.



Screen forms are the interactive user interface to your application. Like paper office forms, the end user can use screen forms to enter information. By using a screen form, the user can also display database records and change or delete existing information.

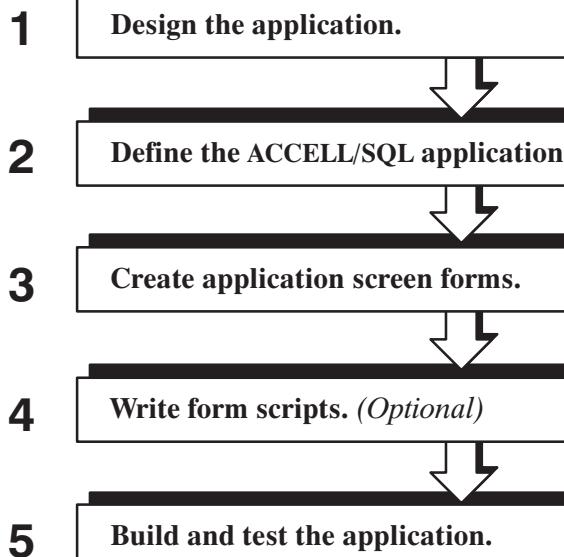
Some of the forms are accompanied by form scripts. A *form script* is a file that contains ACCELL/4GL statements for manipulating events as they occur on the form.

Developing an Application

This section outlines the major steps required for developing an application.

Development Steps

- 1 Design the application.**
- 2 Define the ACCELL/SQL application.**
- 3 Create application screen forms.**
- 4 Write form scripts. (*Optional*)**
- 5 Build and test the application.**



Preliminary Requirements

Before you begin developing an application, you must install and configure ACCELL/SQL in your development environment. You must also be familiar with ACCELL/SQL commands and forms.

Development Environment

Application development must be completed on a standard ASCII terminal (or terminal emulator) with the UNIX or VMS operating systems. After completing the application, you can transfer the application to other computer systems and user interfaces.

For information about how to configure your development environment, see *ACCELL/SQL: Setting Up a User Environment*.

RDBMS Design

The ACCELL/SQL software is designed for use with relational database management systems. The effectiveness of your application is to some extent dependent upon how well the database is designed.

The database design must define the purpose of the database, tables and columns, column relationships, and data types. A good database design defines all tables to either third normal form (3NF) or Boyce-Codd normal form (BCNF). In addition, database consistency and security must be handled by the RDBMS. For complete information about how to design your database, see the documentation provided by the RDBMS supplier.

For information about how to develop an application that is compatible with your RDBMS, see *ACCELL/SQL: RDBMS Integration*. For information about how to create an application for multiple platforms, see *ACCELL/SQL: Portability Guidelines*.



Warning

Do not use a production database for application development.

To avoid potential data loss or corruption, develop and test your application with an experimental database. After thorough testing, implement your application with the actual database. ■

Learning to Use ACCELL/SQL Commands and Forms

Before you begin to use ACCELL/SQL, experiment with the developer's tutorial or the CBT. Also become familiar with ACCELL/Manager commands.

For information about:

Developer's tutorial

CBT (optional)

ACCELL/Manager commands

Read:

ACCELL/SQL: Developer's Tutorial

ACCELL/SQL Tutor

ACCELL/SQL: Using an Application

Step 1: Designing the Application

As with all software development projects, careful planning is important before you begin implementation. Some of the factors you need to consider include these topics:

- user needs and preferences
- data types and formats
- tasks to be accomplished
- data flow
- language
- user privileges
- operating system
- user interface

For information about how to design an application, see “Designing the Application” beginning on page 31.

Step 2: Defining the ACCELL/SQL Application

After you have decided upon a preliminary design for the application, you can create a prototype and begin to define the application in ACCELL/SQL. The application definition defines the name of the application and describes the database schema and tables to be used in the application.

For information about how to create the application, see “Defining the Application” beginning on page 51.



Additional Help

For information about how to create applications that can be used with any RDBMS, see *ACCELL/SQL: Portability Guidelines*. ■

Step 3: Creating Application Screen Forms

You create screen forms with the ACCELL/Generator component. ACCELL/Generator is an interactive, visual tool that enables you to create fields, prompts, and borders directly on the screen.

Each screen form is designed to perform a specific business task or to display related information. The form is usually associated with a particular table in the database and enables the user to view or change values in table rows.

For information about how to add forms to your application, see “Creating Application Screen Forms” beginning on page 71.



Additional Help

For information about how to design and create screen forms, see *ACCELL/SQL: Creating Screen Forms*. □

Step 4: Writing Form Scripts

A form script contains ACCELL/4GL event sections that control when actions are executed for a form. A form script can be used to include zoom forms, functions, customized commands, and other features in your application.

ACCELL/4GL also enables you to specify conditional execution of commands, depending on the user interface, the last command executed, the form mode, and so on.

For information about how to create a form script, see the “Creating Form Scripts” beginning on page 83.



Additional Help

For information about how form scripts interact with application forms, read *ACCELL/SQL: Writing Form Scripts*. □

Step 5: Building and Testing the Application

To build your application, ACCELL/SQL integrates all application components, including forms, scripts, and functions, into an executable application.

For information about how to build and then test your application, see “Building Your Application” beginning on page 91.

After Developing Your Application

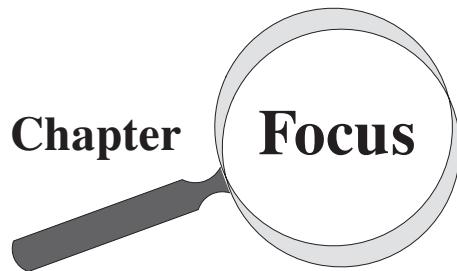
After you have completed development of the application, you are ready to begin implementing your application in a production environment. For the production environment, you can add user features or customize the application for each environment.

To prepare the application for end users, consider these needs:

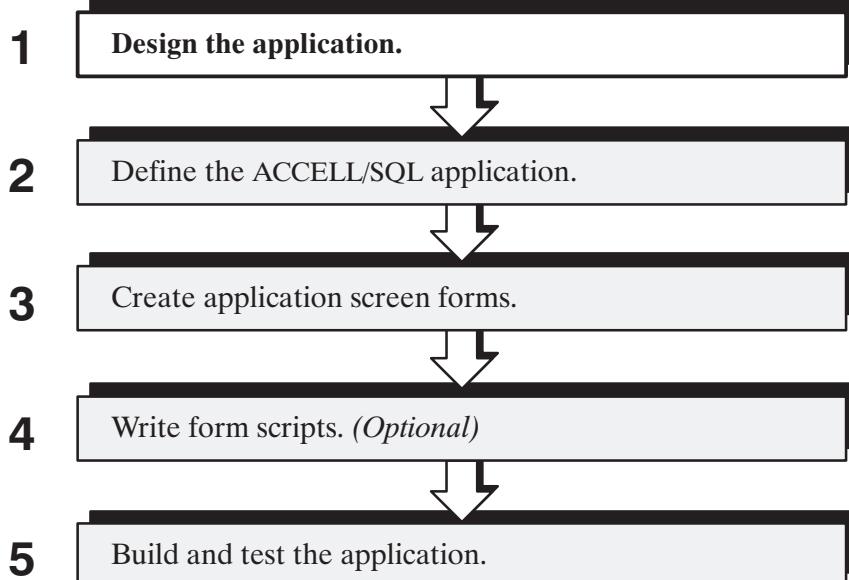
- menus and reports
- user documentation
- user training
- application maintenance

For an overview of these tasks and additional user features, see “[Implementing the Application](#)” beginning on page 107.

Designing an Application



This chapter describes step 1 of the application development process.



This chapter introduces the concepts, terminology, and specifications you need to know for designing your application:

- planning your application
- designing the database layer
- prototyping your application
- using data types
- customizing the application for the local language

Planning Your Application

Before you begin designing the application, you need to set goals and objectives for your application. A successful application must have an easy-to-use user interface. It must also be able to handle large amounts of data. Consider these factors in your design:

- the purpose of the application
- the data to be stored in the database
- the tasks that users need to perform

If an existing information management system is in use, survey the current users to discover what they like or dislike about the current system. If possible, incorporate their suggestions into your design.

With the knowledge you have concerning the application's purpose and users' needs, you're well on your way toward creating a useful application.

The design of your application must identify the following elements:

- forms
- relationships of forms to each other
- database table associated with each form (optional)
- fields on each form
- table columns associated with each form field (optional)
- relationships of fields to other forms
- menu structure for traversing application forms
- form scripts required, if any
- global functions required, if any
- C language functions required, if any

The Database Layer

The design of the database layer is critical to the success of your ACCELL/SQL application. The database must be carefully planned in accordance with relational database principles. For the greatest flexibility, the columns of each database table must be in third normal form. Third normal form is the simplest representation of discrete data elements.

The RDBMS must define and control all aspects of the database, including these elements:

- tables names
- column names in each table
- data type and length of each column
- the relationships between tables and columns
- security, privileges, and recovery
- access methods



Additional Help

For information about how to create a database, see your RDBMS documentation. ■

Transaction Control

ACCELL/SQL provides a default transaction management system. However, transaction control is also dependent upon the security features provided by the RDBMS.

For information about:

Default transaction control

Read:

ACCELL/SQL: Writing Form Scripts

RDBMS transaction management dependencies

ACCELL/SQL: RDBMS Integration

Distributed online transaction processing with global and local databases

ACCELL/TP: Developing an OLTP Application

Terminology

ACCELL/SQL uses a consistent set of terms to describe database information. The terminology used by your RDBMS may differ from the terminology used by ACCELL/SQL. The following table lists some ACCELL/SQL terms and examples of equivalent RDBMS terms.

Database	A set of tables defined in the RDBMS. <i>RDBMS terms:</i> owner, schema, user
Field	A copy of the data contained in a database column. <i>RDBMS terms:</i> attribute, column, field
Record	A copy of a row found in a database table. <i>RDBMS terms:</i> record, row, tuple
Selected set	A copy of the row values retrieved from a database table by a SQL query. <i>RDBMS terms:</i> result table
Table	The largest division of a relational database, consisting of a set of related database columns and rows. <i>RDBMS terms:</i> record type, relation, table

Additional terms are defined in the Glossary found in each ACCELL/SQL manual.



Additional Help

For more information about how features of your RDBMS correlate with ACCELL/SQL components, see *ACCELL/SQL: RDBMS Integration*. ■

Prototyping

Prototyping is a method for creating a model of the application in an experimental environment. To avoid possible data loss or corruption, do not attempt to create your application in a production environment with an existing database. To create a prototype application, consider using these methods:

- Create an experimental database with sample tables and data.
- Experiment with a variety of form layouts.
- Experiment with extreme examples of data as well as typical examples.
- Design forms to perform tasks from the user's perspective.
- Perform usability testing on the prototype; obtain user feedback and recommendations.
- Revise the application or database in accordance with usability results.
- Thoroughly test the application.



Tip

Create and test your application in small units, one form at a time. Build and test the application after each change. ■

Creating a Default Application

To create a default application, you can use the **MKAP** utility. The **MKAP** utility creates a master application form and one form for each table in the database. You can use the default application for experimentation, for instance, to verify that the database and user interface layer are properly configured.



Warning

The MKAP utility overwrites existing application forms and scripts.
Use this utility only for creating a new application. ■

To create a default master application form only, you can use the **make_maf** utility.



Additional Help

For information about how to use ACCELL/SQL utilities, see *ACCELL/SQL: Configuration Variable and Utility Reference*. ■

**Form
Documentation**

For each application form, you can execute the **FRMDOC** utility to print a description of the form and each field on the form. You can then use these descriptions as a basis for documenting your application.

Data Types

This section describes the data types provided by ACCELL/SQL:

- AMOUNT
- BINARY
- BOOLEAN
- FLOAT
- DATE
- NUMERIC
- STRING
- TEXT

The RDBMS data types do not always correspond to ACCELL/SQL data types. However, ACCELL/SQL provides default data type conversions, depending upon the RDBMS. In addition, you can convert data types by using ACCELL/4GL system functions.

The tables in this section list ACCELL/SQL features that manipulate data types. The display format of data types can be customized by using formatting templates. For information about format templates, see *ACCELL/SQL: Localizing an Application*.



Additional Help

To determine the data types that correspond to your RDBMS data types, see *ACCELL/SQL: RDBMS Integration*. □

Amount Data

An amount constant is a floating-point value of up to 11 digits total; by default, the value includes a decimal point and 2 digits of precision to the right of this decimal point, plus a sign and radix separator.

AMOUNT Data Type Features

Category	Feature	Manual That Describes Feature
Configuration variables	<i>AMTFMT</i> <i>AMTNULLCH</i> <i>AMTPREC</i> <i>AMTROUND</i> <i>CURRSYM</i> <i>RADIXSEP</i> <i>TRIADSEP</i>	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	DISPLAY_FORMAT DISPLAY_JUSTIFY FIELD_LENGTH	<i>ACCELL/SQL: Script and Function Reference</i>
Form script statements	DISPLAY EXTERN	<i>ACCELL/SQL: Script and Function Reference</i>
System functions	to_amount\$() to_float\$() to_num\$()	<i>ACCELL/SQL: Script and Function Reference</i>

Example **1234.56**

Binary Data

A binary value consists of binary data rather than character data. By default, if a binary value exceeds the length allocated in memory, ACCELL/SQL stores the value in an external file on disk.

Form fields cannot be created for binary data types. To display binary data on the screen, use a C-hook function in the form script.

You can manipulate and store binary data by using the ACCELL/SQL features listed in the following table. For complete descriptions of these features, see the specific ACCELL/SQL manual listed in the rightmost column.

BINARY Data Type Features

Category	Feature	Manual that describes feature
Configuration variables	<code>ACLVARDIR</code> <code>ACLVARMEMLIM</code>	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	<code>FILE_PATH</code> <code>IN_MEMORY</code> <code>RETRIEVE_VALUE</code>	<i>ACCELL/SQL: Script and Function Reference</i>
Form script statements	<code>EXTERN</code> <code>RETRIEVE</code> <code>STORE</code>	<i>ACCELL/SQL: Script and Function Reference</i>
System functions	<code>binarylen\$()</code> <code>subbinary\$()</code> <code>to_amount\$()</code> <code>to_binary\$()</code> <code>to_bool\$()</code> <code>to_date\$()</code> <code>to_float\$()</code> <code>to_num\$()</code> <code>to_string\$()</code> <code>to_time\$()</code> <code>val_to_str\$()</code>	<i>ACCELL/SQL: Script and Function Reference</i>



Additional Help

For information about binary data storage and retrieval, see *ACCELL/SQL: Managing an Application*. ■

Boolean Data

A Boolean constant specifies a true/false condition. The default values YES and NO can be translated or converted to other values. The default null display character for Boolean data is an asterisk (*).

BOOLEAN Data Type Features

Category	Feature	Manual That Describes Feature
Configuration variables	<i>BOLNULLCH</i> <i>BOOLFMT</i>	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	DISPLAY_FORMAT DISPLAY_JUSTIFY EXTERN FIELD_LENGTH	<i>ACCELL/SQL: Script and Function Reference</i>
System functions	to_bool\$() to_num\$()	<i>ACCELL/SQL: Script and Function Reference</i>

Example **TRUE**

Float Data

A float constant is a floating-point value of up to 17 digits total; the value includes a decimal point and up to 9 digits of precision to the right of this decimal point. By default, values are formatted with the `%g` notation of the `printf()` function in either decimal or scientific notation, which gives full precision in minimum space. Values can be formatted with the number format symbols or the `printf()` format.

FLOAT Data Type Features

Category	Feature	Manual That Describes Feature
Configuration variables	<code>FLT_FMT</code> <code>FLTNULLCH</code> <code>FLT_ROUND</code>	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	<code>DISPLAY_FORMAT</code> <code>DISPLAY_JUSTIFY</code> <code>EXTERN</code> <code>FIELD_LENGTH</code>	<i>ACCELL/SQL: Script and Function Reference</i>
Form script statements	<code>DISPLAY</code>	<i>ACCELL/SQL: Script and Function Reference</i>
System functions	<code>to_amount\$()</code> <code>to_float\$()</code> <code>to_num\$()</code>	<i>ACCELL/SQL: Script and Function Reference</i>

Example

12345678.123456789



Additional Help

For information about the `print()` format, see *ACCELL/SQL: Localizing an Application*. ■

Date Data

A date constant specifies month, day, and year values in the form MM/DD/YY or MM/DD/YYYY, where MM, DD, and YY are integers: MM in the range 1 to 12, DD in the range 1 to 31, YY in the range 00 to 99, and YYYY in the range 0000 to 9999.

DATE Data Type Features

Category	Feature	Manual That Describes Feature
Configuration variables	<code>DATEFMT</code> <code>DATNULLCH</code> <code>MON1...MON12</code>	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	<code>DISPLAY_FORMAT</code> <code>DISPLAY_JUSTIFY</code> <code>EXTERN</code> <code>FIELD_LENGTH</code>	<i>ACCELL/SQL: Script and Function Reference</i>
System functions	<code>date_to_mdy\$()</code> <code>mdy_to_date\$()</code> <code>null_convert\$()</code> <code>str_to_date\$()</code> <code>str_to_time\$()</code> <code>to_num\$()</code> <code>to_date\$()</code> <code>to_time\$()</code>	<i>ACCELL/SQL: Script and Function Reference</i>

Example **01/01/93**



Additional Help

For information about how RDBMS date-time values are processed, see *ACCELL/SQL: RDBMS Integration*. ■

Numeric Data

A numeric constant is an integer value of up to 9 digits. By default, NUMERIC data is formatted with right justification. Values can be formatted with the number format symbols or the `printf()` format.

NUMERIC Data Type Features

Category	Feature	Manual That Describes Feature
Configuration variables	<code>NUMFMT</code> <code>NUMNULLCH</code>	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	<code>DISPLAY_FORMAT</code> <code>DISPLAY_JUSTIFY</code> <code>EXTERN</code> <code>FIELD_LENGTH</code>	<i>ACCELL/SQL: Script and Function Reference</i>
Form script statements	<code>DISPLAY</code>	<i>ACCELL/SQL: Script and Function Reference</i>
System functions	<code>to_amount\$()</code> <code>to_bool\$()</code> <code>to_num\$()</code>	<i>ACCELL/SQL: Script and Function Reference</i>

Example

987654321

String Data

A string constant is a character string value enclosed by a pair of apostrophes ('string') of up to 253 characters. By default, STRING data is formatted with left justification. Values can be formatted with the string format symbols.

Special characters can be included within a string by using the following codes:

<code>\n</code>	New line
<code>\t</code>	Tab
<code>\b</code>	Backspace
<code>\r</code>	Return
<code>\'</code>	Apostrophe
<code>\ </code>	Backslash

STRING Data Type Features

Category	Feature	Manual That Describes Feature
Configuration variables	<code>STRNULLCH</code>	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	<code>CASE_CONVERSION</code> <code>DISPLAY_FORMAT</code> <code>DISPLAY_JUSTIFY</code> <code>EXTERN</code> <code>FIELD_LENGTH</code>	<i>ACCELL/SQL: Script and Function Reference</i>
Form script statements	<code>DISPLAY</code>	<i>ACCELL/SQL: Script and Function Reference</i>
System functions	<code>char_code_to_str\$()</code> <code>clip_str\$()</code> <code>glob_str_compare\$()</code> <code>pad_str_left\$()</code> <code>pad_str_right\$()</code> <code>reg_exp_str_compare\$()</code> <code>str_to_char_code\$()</code> <code>str_to_date\$()</code> <code>str_to_time\$()</code> <code>str_to_val\$()</code> <code>strlen\$()</code> <code>substr\$()</code> <code>to_string\$()</code> <code>to_string_using\$()</code> <code>val_to_str\$()</code>	<i>ACCELL/SQL: Script and Function Reference</i>
User commands	Editing commands	<i>ACCELL/SQL: Using an Application</i>

Example **'Hello'**

Text Data

A text value is a variable-length string; the length of a text value often exceeds the size of the field allocated for it. By default, if a text value exceeds the length allocated in memory, ACCELL/SQL stores the value in an external file on disk.

You can manipulate and store text data by using the ACCELL/SQL features listed in the following table. For complete descriptions of these features, see the specific ACCELL/SQL manual listed in the rightmost column.

TEXT Data Type Features

Category	Feature	Manual that describes feature
Configuration variables	ACLTXTNONDSPCH ACLVARDIR ACLVARMEMLIM	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	AUTO_EDIT CASE_CONVERSION DISPLAY_FORMAT DISPLAY_JUSTIFY FILE_PATH IN_MEMORY RETRIEVE_VALUE	<i>ACCELL/SQL: Script and Function Reference</i>
Form script statements	EXTERN RETRIEVE STORE	<i>ACCELL/SQL: Script and Function Reference</i>

continued on next page

TEXT Data Type Features (continued)

Category	Feature	Manual that describes feature
System functions	clip_str\$() get_line_of_text\$() glob_str_compare\$() pad_str_left\$() pad_str_right\$() reg_exp_str_compare\$() str_to_char_code\$() str_to_date\$() str_to_time\$() str_to_val\$() strlen\$() substr\$() to_string\$() to_string_using\$() to_text\$() val_to_str\$()	<i>ACCELL/SQL: Script and Function Reference</i>
User commands	Text-editing commands	<i>ACCELL/SQL: Using an Application</i>



Additional Help

<i>About</i>	<i>See</i>
Storage and retrieval of text data	<i>ACCELL/SQL: Managing an Application</i>
Text screen fields	<i>ACCELL/SQL: Creating Screen Forms</i>

Time Data

A time constant specifies hour and minute values in the form HH:MM, where HH and MM are integers: HH in the range 00 to 23 and MM in the range 00 to 59.

TIME Data Type Features

Category	Feature	Manual That Describes Feature
Configuration variables	<code>TIMEFMT</code> <code>TIMNULLCH</code>	<i>ACCELL/SQL: Configuration Variable and Utility Reference</i>
Attributes	<code>DISPLAY_FORMAT</code> <code>DISPLAY_JUSTIFY</code> <code>EXTERN</code> <code>FIELD_LENGTH</code>	<i>ACCELL/SQL: Script and Function Reference</i>
System functions	<code>date_to_mdy\$()</code> <code>mdy_to_date\$()</code> <code>null_convert\$()</code> <code>str_to_date\$()</code> <code>str_to_time\$()</code> <code>to_num\$()</code> <code>to_date\$()</code> <code>to_time\$()</code>	<i>ACCELL/SQL: Script and Function Reference</i>

Example **23:59**



Additional Help

For information about how RDBMS date-time values are processed, see *ACCELL/SQL: RDBMS Integration*. ■

Local Language Support

The default language for applications is American English. However, you can customize your applications for any country or region. Many prompts and messages visible to the user can be translated into the required language. Adapting an application to specific languages is called *localization*.

Localizing an application can be as simple as setting a parameter to a predefined language file. For languages or dialects that are not provided by ACCELL/SQL, you can create customized translation maps with a text editor.

Localization enables you to customize many application features, for example:

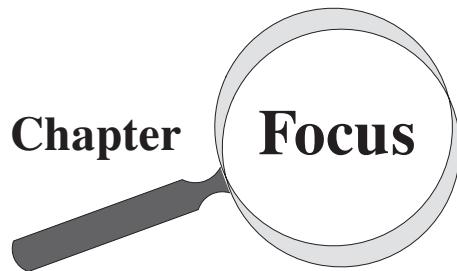
- currency format
- date format
- Boolean values
- time format
- number formats



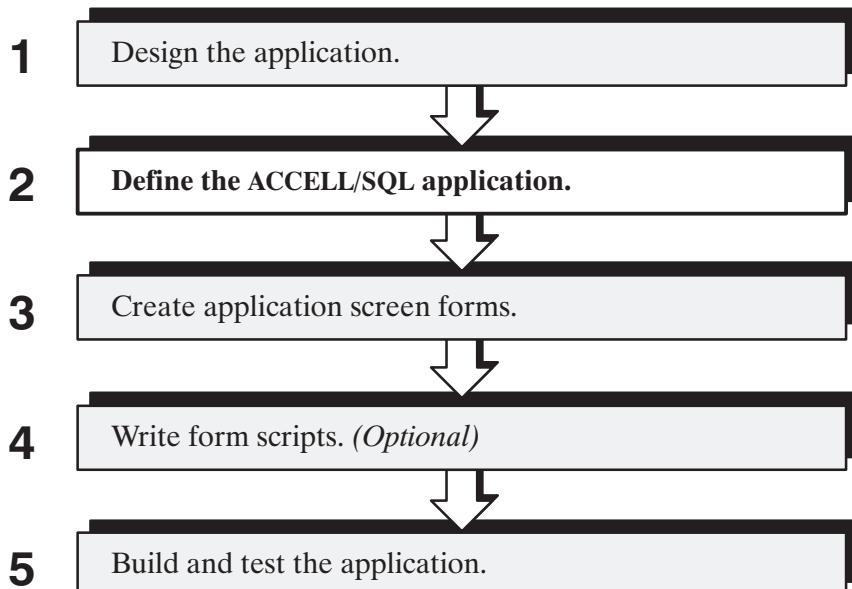
Additional Help

For detailed information about localization, see *ACCELL/SQL: Localizing an Application*. ■

Defining the Application



This chapter describes steps 2 of the application development process.



This chapter explains how to use ACCELL/Environment for creating and defining an application:

- choosing an application development method
- starting the ACCELL/SQL software
- using development forms
- creating a new application
- maintaining the application

Before using the procedures described in this chapter, become familiar with ACCELL/Manager, as described in *ACCELL/SQL: Using an Application*.

Choosing an Application Development Method

To develop your application, you have a choice of two methods:

- command-line utilities
- ACCELL/Environment



Warning

Do not attempt to use both application development methods at the same time. To ensure that your application files remain consistent with each other, use only one method. ■

Command-Line Utilities

Each ACCELL/SQL component can be executed by using a command-line utility at the operating system level. If you use utilities, you must manage files and compile and build your application entirely at the operating system level.

To use utilities, follow these general steps:

1. Create screen forms by using the **AGEN** utility.
2. Create form scripts by using your system file editor.
3. Compile form scripts by using the **ACPL** utility.
4. Combine the form and script object files by using the **ACMB** utility.
5. Create the completed application by using the **ALNK** utility.
6. Execute the completed application by using the **AMGR** utility.



Additional Help

For detailed information about utilities, see *ACCELL/SQL: Configuration Variable and Utility Reference*. ■

Using ACCELL Environment

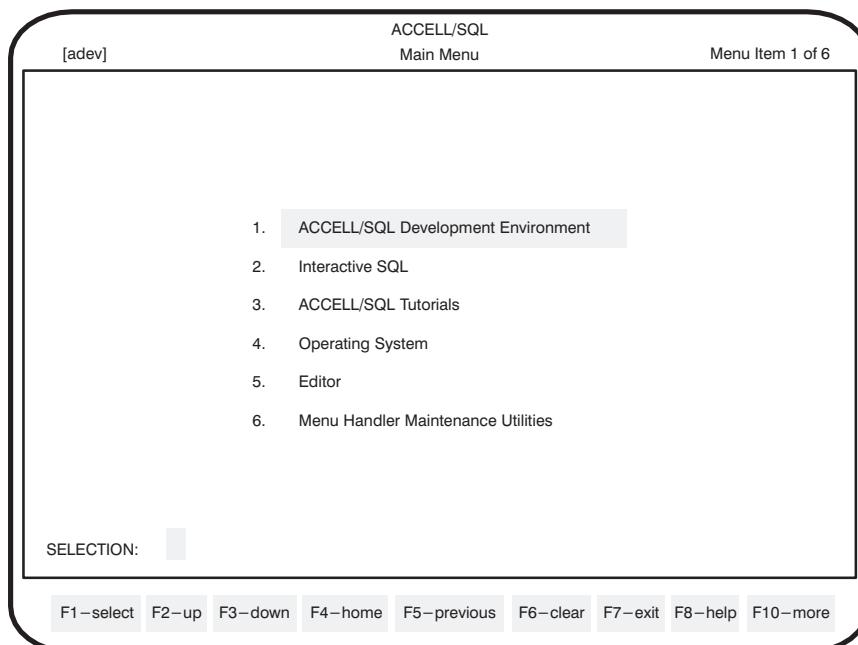
This manual describes how to use ACCELL/Environment to create your application. By using ACCELL/Environment, you do not have to manage your files at the operating system level. ACCELL/SQL automatically executes the required utilities for you at each step.

Starting ACCELL/SQL

Before you begin using ACCELL/SQL, verify that your environment has been correctly configured, as described in *ACCELL/SQL: Setting Up a User Environment*. All ACCELL/SQL utilities and forms use the default directories, language, and database specified by your configuration.

The ACCELL/SQL Main Menu

To begin using ACCELL/SQL, execute the **acell** utility from the operating system command line. The Main menu appears, as shown below.



The appearance of the Main menu may differ, depending upon the RDBMS you are using.

Selecting an Option

You can select an option from the menu in three ways:

- Type the item number and then press **RETURN**.
- Press **DOWN** or **UP** to move the menu pointer to the option you want to select. Then press **RETURN**.
- Type the utility name for the program and then press **RETURN**. Utility names for the ACCELL/SQL Main menu options are listed in the following table.

Main Menu Options and Utility Names

Menu Option	Utility
ACCELL/SQL Development Environment	adev
Interactive SQL	<i>RDBMS dependent*</i>
ACCELL/SQL Tutorials	tutorial
Operating System	sh
Editor	edit
Menu Handler Maintenance Utilities	mhmnt

* This option executes the command provided by the RDBMS to execute SQL commands.

Menu Commands

The next table summarizes the default commands that can be used on an ACCELL/SQL menu.

Command Key Default Settings

Action	Name	Default Command Keys
Select highlighted option	select	ESCAPE or F1
Move menu pointer up	up	UP CONTROL U CONTROL K
Move menu pointer down	down	DOWN RETURN CONTROL J LINEFEED
Go to home menu	home	HOME F2 CONTROL X
Go to previous menu	previous	F3 CONTROL P
Clear selection line	clear	F4 CONTROL P DELETE
Exit	exit	F5 CONTROL D
Display help	help	F6 ?
Display more command keys	more	/ F10
Display information about the highlighted menu line	info	F7 TAB CONTROL I
Redraw screen	redraw	F8 CONTROL R
Toggle command key line on/off	toggle	F9 CONTROL T

For character mode applications, you can customize function key definitions by changing the **unicap** file. For information about the **unicap** file, see *ACCELL/SQL: Setting Up a User Environment*.

Main Menu Options

The ACCELL/SQL Main menu lists options you can use to learn ACCELL/SQL and develop applications. These options are explained in this subsection.

ACCELL/SQL Development Environment

This option starts ACCELL/Environment. ACCELL/Environment enables you to create application forms, edit ACCELL/4GL scripts, compile an application, and run prototype applications without exiting to the operating system.

ACCELL/Environment simplifies the development cycle by using the same window interface for both ACCELL/Environment and end-user applications. You can switch between designing and running applications almost instantly, without changing command sets.

Interactive SQL

This option starts the SQL program for your RDBMS.

See your RDBMS SQL manuals for more information about SQL.

ACCELL/SQL Tutorials

This option displays a submenu for running the developer's tutorial.

For information about how to use the developer's tutorial, see *ACCELL/SQL: Developer's Tutorial*.

Operating System

This option starts an operating system subprocess, where you can execute operating system commands.

To return to the Main menu, exit the operating system by using the appropriate operating system command.

Editor

This option runs the default system file editor. If you have set the *EDIT* environment variable, this option uses the specified editor. Otherwise, the default system editor is used.

*Menu Handler
Maintenance Utilities*

When you use **MENU SELECT** to select this option or enter **edit** at the selection prompt, the file editor opens an unnamed file. You can name the file when you save it.

When you enter **edit** and a file name at the selection prompt, the file editor opens the specified file.

When you exit the editor, the menu reappears.

This option displays a submenu for creating user menus with Menu Handler. The Menu Handler Maintenance Utilities menu also includes an option for creating a default application with the **MKAP** utility.

For information about how to create user menus with Menu Handler, see *ACCELL/SQL: Localizing an Application*.

For information about the **MKAP** utility, see *ACCELL/SQL: Configuration Variable and Utility Reference*.

*Make Default
Application*

This option executes the **MKAP** utility to create a prototype or default application. The default application includes a master application form and one standard form for each database table. When **MKAP** is accessed from the ACCELL /SQL menu, it runs as an interactive program and prompts you for information such as the application name and table names.



Warning

The MKAP utility overwrites existing application forms and scripts.

Use this utility only for creating a new application. ■



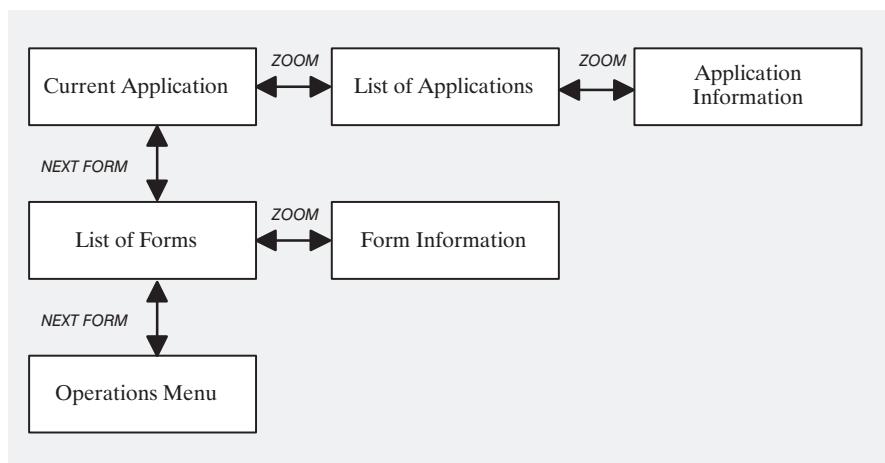
Additional Help

For information about how to use ACCELL/SQL utilities, see *ACCELL/SQL: Configuration Variable and Utility Reference*. ■

ACCELL/Environment Forms

ACCELL/Environment provides a series of easy-to-use forms that enable you to develop your ACCELL/SQL application interactively on the screen.

ACCELL/Environment Forms



Additional Help

To learn more about navigation between forms, see *ACCELL/SQL: Developer's Tutorial*. ■

Current Application Form

The first ACCELL/Environment form displayed is the Current Application form. This one-field form is used to specify the name of the current application. The *current application* is the application you are creating or executing.

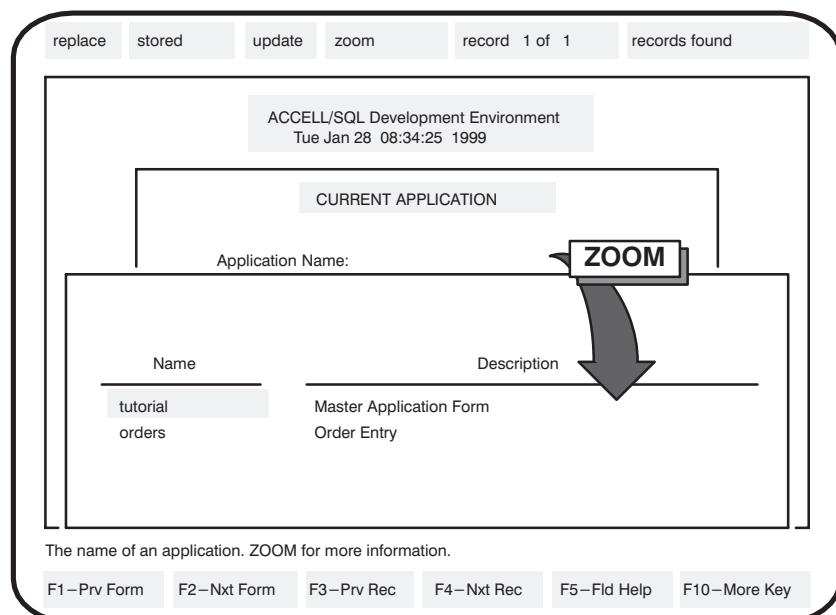
Current Application Form

A screenshot of a computer screen showing the ACCELL/SQL Development Environment. The window title is "ACCELL/SQL Development Environment" and the subtitle is "Tue Jan 28 08:34:25 1999". The main area is titled "CURRENT APPLICATION". Inside this area, there is a text input field labeled "Application Name:" containing the value "tutorial". At the bottom of the window, there is a message: "Enter an existing application name, or ZOOM to add or list applications." Below this message is a row of function keys: F1–Prv Form, F2–Nxt Form, F3–Sz Form, F4–Mv Form, F5–Fld Help, and F10–More Key.

List of Applications Form

You can access the List of Applications form by pressing **ZOOM** from the Current Application form. This form lists all the applications currently defined for this database and includes a brief description of each application.

List of Applications Form

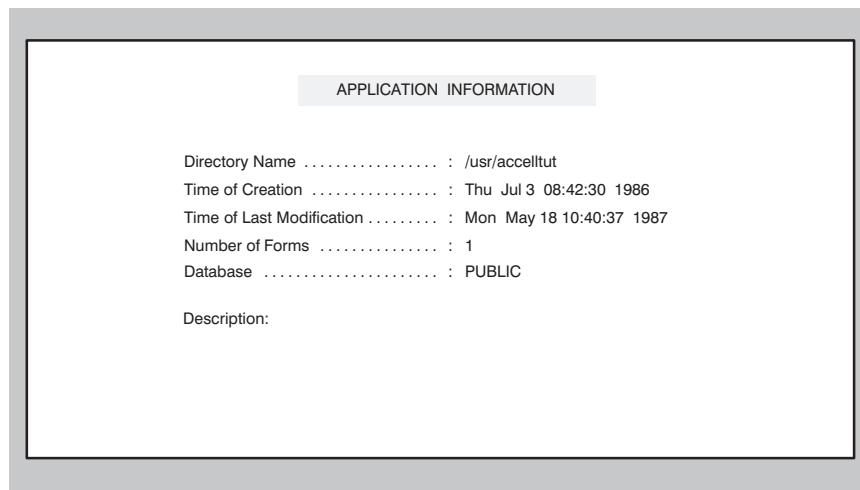


The screenshot shows a software interface titled "ACCELL/SQL Development Environment" with the date "Tue Jan 28 08:34:25 1999". At the top, there are buttons for "replace", "stored", "update", "zoom", "record 1 of 1", and "records found". Below these is a section labeled "CURRENT APPLICATION" containing a table with two rows. The first row has columns "Name" and "Description", with entries "tutorial" and "Master Application Form" respectively. The second row has entries "orders" and "Order Entry". A callout box points to the "ZOOM" key on the keyboard at the bottom of the screen, which is highlighted with a red border. The keyboard labels are: F1–Prv Form, F2–Nxt Form, F3–Prv Rec, F4–Nxt Rec, F5–Fld Help, and F10–More Key.

Application Information Form

The Application Information form displays descriptive information about the current application. You can access the Application Information form from the List of Applications form by positioning the cursor on the name of the application and then pressing **ZOOM**.

Application Information Form



The screenshot shows a window titled "APPLICATION INFORMATION". Inside the window, there is a list of application details:

Directory Name	:	/usr/acceltut
Time of Creation	:	Thu Jul 3 08:42:30 1986
Time of Last Modification	:	Mon May 18 10:40:37 1987
Number of Forms	:	1
Database	:	PUBLIC

Below the details, there is a label "Description:" followed by a large empty text area.

For a description of the fields on this form, see “The Fields of the Application Information Form” on page 69.

List of Forms Form

The List of Forms form displays a list of existing screen forms. For information about how to use this form, see page 76.

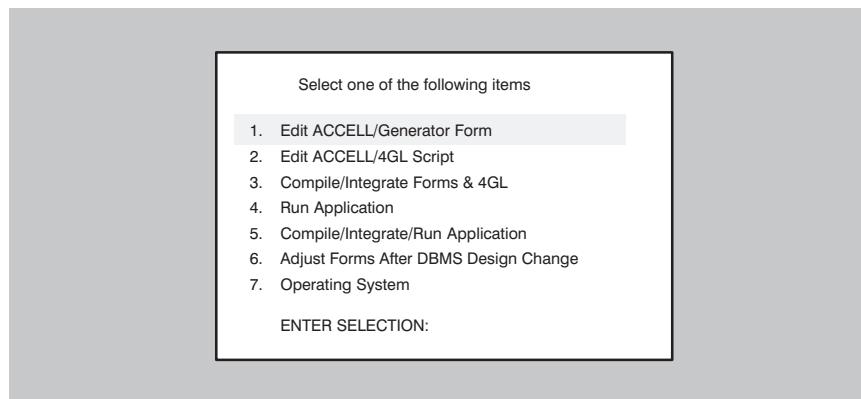
Form Information Form

The Form Information form displays information about existing screen forms. For information about how to use this form, see page 78.

Operations Menu

The Operations menu enables you to create and build your application automatically. To display the Operations menu, position the cursor on the name of a form; then press **NEXT FORM**.

Operations Menu



Each of the options on the Operations menu is described below.

“Edit ACCELL/Generator Form” Option

This option starts ACCELL/Generator on the current form. You can then edit the form by using the commands described in *ACCELL/SQL: Creating Screen Forms*.

“Edit ACCELL/4GL Scripts” Option

This option starts the system file editor on the form script associated with the current application form.

“Compile/Integrate Forms & 4GL” Option

This option executes the **ACMB** and **ALNK** utilities to combine and link your application files. Compilation errors, if any, are displayed on the screen.

“Run Application” Option

This option calls ACCELL/Manager to execute your current application using the last version of the application you built. This option does not compile any forms or changes you may have made since the last compilation.

“Compile/Integrate/Run Application” Option

This option executes the **ACPL**, **ACMB** and **ALNK** utilities to compile, combine and link your application files. If there are no errors, ACCELL/Manager is called to begin execution of the completed application.

If compilation errors occur, ACCELL/Manager is not executed.

“Adjust Forms After a DBMS Design Change” Option

This option updates the application form files to correspond to the new data dictionary. You must select this option after you have made changes to the database design.

If you do not run this option after a database change, your forms may not work correctly with their target records.



Tip

You can also perform this update from the operating system command line by using the **q2a2q** utility. ■

For information about how to use the **q2a2q** utility, see *ACCELL/SQL: Configuration Variable and Utility Reference*.

“Operating System” Option

This option temporarily suspends ACCELL/Environment to create an operating system subprocess. You can execute operating system commands in the subprocess.



Warning

Do not restart ACCELL/SQL from a temporary operating system subprocess. When you create a subprocess, you still have an active ACCELL/SQL session, which is suspended. Creating multiple executions of ACCELL/SQL is both confusing and costly on memory usage. ■

Creating a New Application

To create a new application, complete these steps:

1. Enter ACCELL/Environment.
2. Define the application.
3. Exit ACCELL/Environment.

Each of these steps is described below.

Entering ACCELL/Environment

You can use ACCELL/Environment from either of two access points:

- Main menu
- **adev** utility

When you begin execution of ACCELL/Environment, the Current Application form appears first.

Using the Main Menu

To use the Main menu, start ACCELL/SQL from the operating system command line by executing the **accell** utility; the Main menu then appears on the screen. To enter ACCELL/Environment from the Main menu, select option 1, “ACCELL/SQL Development Environment.”

For information about the **accell** utility, see the description given in *ACCELL/SQL: Configuration Variable and Utility Reference*.

Using the **adev** Utility

From the operating system command line, you can enter ACCELL/Environment by executing the **adev** utility.

For information about how to use utilities, see *ACCELL/SQL: Configuration Variable and Utility Reference*.

Defining a New Application

To define a new application in ACCELL/Environment:

1. From the Current Application form, press **ZOOM**. The List of Applications form appears.
2. From the List of Applications form, press **CLEAR TO ADD**.
3. Type the name of the application you want to add (11 characters maximum).
4. Press **RETURN** and type an application description (70 characters maximum).
5. Press **ADD/UPDATE** to save your entry. The Message field displays informational messages as your application is created.

To define the application, ACCELL/Environment automatically performs these operations:

- creates the **aclenv** directory
- creates an application directory under **aclenv**
- registers the application
- creates a master application form, using the application's name and the **.aq** suffix
- creates a master application form script file, using the application name and the **.as** suffix

6. Press **ZOOM** to display the Application Information form. Complete the form with appropriate information. (For a description of the fields on this form, see "The Fields of the Application Information Form" on page 69.)
7. Press **ADD/UPDATE** to save the application information.
8. Press **PREVIOUS FORM** to return to the List of Applications form.

Exiting ACCELL/Environment

To exit ACCELL/Environment:

1. Press **PREVIOUS FORM** to return to the Current Application form.
2. Press **PREVIOUS FORM** again. If you entered ACCELL/Environment by selecting the "ACCELL/SQL Development Environment" option, the Main menu reappears. Otherwise, if you used the **adev** utility from the operating system command line, the operating system prompt reappears.

Maintaining Application Definitions

All applications can be maintained with the List of Applications form. By using List of Applications, you can perform these operations on an existing application:

- select the application
- change the application description
- delete the application

Selecting an Application

Before you can perform any application or form operation, you must first select the application.

To select an application, complete these steps:

1. From the Main menu, select option 1, “ACCELL/SQL Development Environment.” The Current Application form appears, and the Application Name field displays the name of the first application.
2. From the Current Application form, press **ZOOM**. The List of Applications form appears.
3. Press **NEXT RECORD** to position the cursor on the name of an application.
4. Press **PREVIOUS FORM**. The name of the application on which the cursor was positioned is returned to the Current Application form.
5. To display the list of forms for the application, press **RETURN** or **NEXT FORM**.

Or, if you already know the name of the application you need to access, simply type the application name in the Application Name field of the Current Application form.

Changing an Existing Application Description

To change the description of an application, complete these steps:

1. From the Current Application form, press **ZOOM**. The List of Applications form appears.
2. Position the cursor on the application description by using the **NEXT RECORD** and **NEXT FIELD** commands. Type the new description over the existing description.
3. Press **ADD/UPDATE** to save your entry.
4. With the cursor still positioned on the application description, press **ZOOM** to display the Application Information form. Change the information as needed. (For information about the fields of this form, see the next section, “The Fields of the Application Information Form.”)
5. Press **ADD/UPDATE** to save your changes.
6. Press **PREVIOUS FORM** to return to the List of Applications form.
7. Press **CANCEL ZOOM** to return to the Current Application form.

The Fields of the Application Information Form

The fields of the Application Information form display detailed information about the current application. You can view current information, and for some fields you can change the information that is displayed.

The Application Information form displays the following information about the application:

Directory Name

(Display-only field) Displays the full directory specification for the directory where the application files are located.

Time of Creation

(Display-only field) Displays the date and time that the application was first defined.

Time of Last Modification

(Display-only field) Displays the date and time of the last change made to the application.

Number of Forms

(Display-only field) Displays the number of forms defined for the application.

<i>Database</i>	Displays the default database name assigned by the RDBMS. If you have been granted the required RDBMS privileges, you can change the name in the <i>Database</i> field by using the ACCELL/SQL field-editing commands.
<i>Description</i>	Displays your comments about the application. You can add or change information in this field by using the ACCELL/SQL field-editing commands. You can enter up to five lines of descriptive information (50 characters per line).

Deleting an Application

To delete an application, complete these steps:

1. From the Current Application form, press **ZOOM**. The List of Applications form appears.
2. Position the cursor on the name of the application to be deleted by using the **NEXT RECORD** command.
3. Press **DELETE RECORD**. The following prompt appears:
Delete the application (yes/no)?
4. Type **yes** and press **RETURN**.

(A **no** response will abort the **DELETE RECORD** command.)

The application name and description are cleared from the screen. All forms and files associated with the application are deleted.

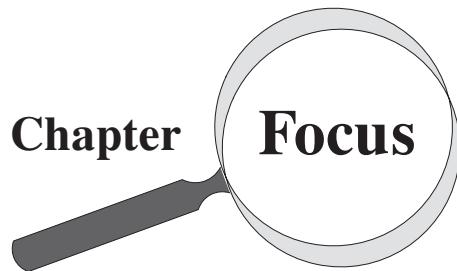
5. Press **CANCEL ZOOM** to return to the Current Application form.
6. Press **PREVIOUS FORM** to return to the Main menu.



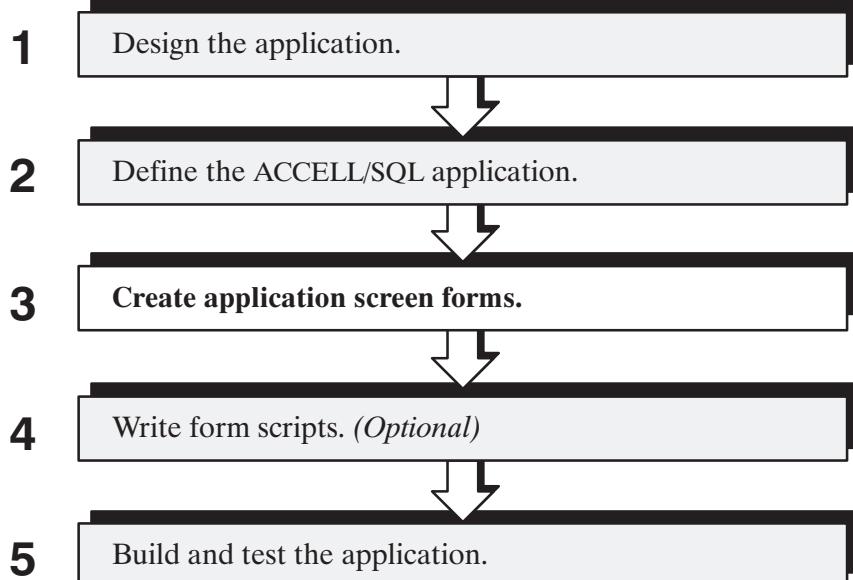
Warning

When you delete an application, the application directory, all of the application's forms and scripts, and associated environment data dictionary information are permanently removed from the system.
To recover the application, you must restore it from a backup copy. ■

Creating Application Screen Forms



This chapter describes step 3 of the application development process.



From ACCELL/Environment you can perform these operations on application forms:

- design screen forms
- define a new form
- display information about forms
- change form information
- delete a form

Designing Screen Forms

Screen forms are the primary interface between the end user and the database. The user can perform many tasks on a form, for example:

- view existing information
- add new information
- change information

To design screen forms, you use the ACCELL/Generator component of ACCELL/SQL. In ACCELL/Generator, you can create three types of screen forms:

master application form	The master application form is the entry and exit point of your application. The master application form can also display system information and perform initialization tasks.
standard form	A standard form serves as a data-entry point. A typical application usually has one or more standard forms. Each form performs a specific task for the user.
zoom form	A zoom form provides a data lookup capability. For example, the user can look up values displayed in a zoom form and then transfer them to the current standard form.

What Is ACCELL/Generator?

With ACCELL/Generator you can perform the following tasks:

- define forms
- create the screen format
- create headings and borders
- define and position fields on the form
- position forms on the screen
- create help windows for form fields
- provide online help
- associate form fields with columns in the database



Additional Help

For complete information about ACCELL/Generator, see *ACCELL/SQL: Creating Screen Forms*. ■

Designing Forms for Character Terminals

A character-based screen form is created by using standard alphanumeric characters. The user can manipulate a character-based screen form by pressing standard terminal keys or function keys.

The following illustration shows an example of both a master application form and a standard form displayed on a terminal screen.

The diagram illustrates a terminal screen displaying two types of forms. At the top, there is a horizontal bar with several buttons: 'replace', 'stored', 'update', 'record 1 of 10', and 'records found'. Below this is a large rectangular area divided into two sections. The left section contains fields for 'COMPANY:', 'ADDRESS:', 'CITY:', 'STATE:', 'MAIN PHONE:', 'CONTACT:', 'TITLE:', and 'PHONE:'. The right section contains fields for 'SALES REP NO.', 'NAME:', and 'REP PHONE:'. Below these sections is a message 'Enter the company name.' At the bottom of the screen are several function key labels: 'F1–Prv Form', 'F2–Nxt Form', 'F3–Prv Rec', 'F4–Nxt Rec', 'F5–Fld Help', and 'F10–More Key'. A line labeled 'Master application form' points to the top edge of the main display area, and another line labeled 'Standard form' points to the left edge of the same area.

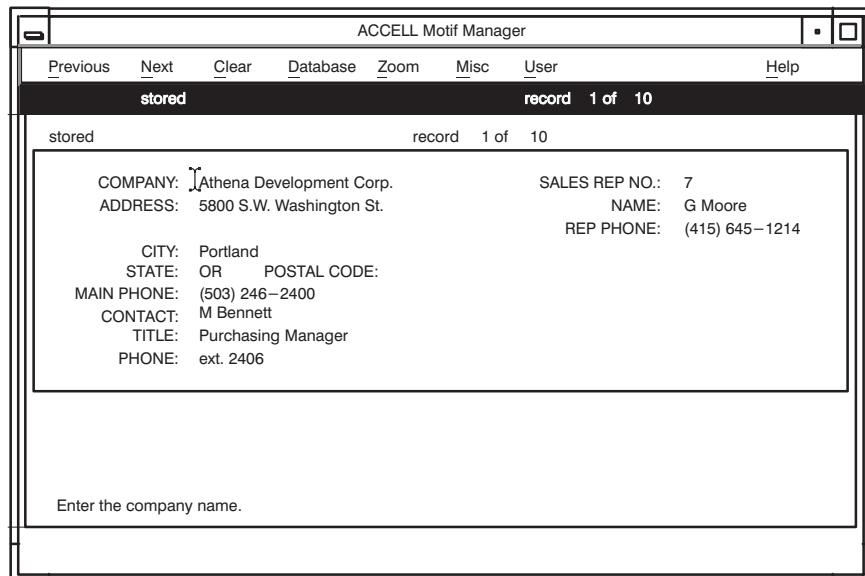
Designing Forms for Graphical User Interfaces

ACCELL/SQL provides graphical user interface (GUI) capabilities for use with systems such as OPEN LOOK, Motif, and Microsoft Windows. By using GUI features, you can add powerful features to your application, for example:

- mouse selection capabilities (“point and click”)
- command buttons
- popup windows and menus
- scroll bars

The following illustration shows an example of a standard form displayed in a Motif window.

Motif UI option
base window



Additional Help

For information about how to design screen forms for graphical user interfaces, see *ACCELL/SQL: Developing an Application for a Graphical User Interface*. ■

Defining a New Form

This section describes how to define a new form and then start ACCELL/Generator.

To define a new form, complete these steps:

1. From the Current Application form, press **NEXT FORM**. The List of Forms form appears.

List of Forms Form

The screenshot shows a software interface titled "LIST OF FORMS FOR CURRENT APPLICATION". Below the title is a table with two columns: "Form Name" and "Form Description". The table contains five rows of data:

Form Name	Form Description
tutorial	Master Application Form
fcompany	Company Entry/Inquiry
fleads	Prospect Tracking
forders	Order Entry/Inquiry

2. From the List of Forms form, press **CLEAR TO ADD**. A new, empty form record appears.
3. Type the name of the form you want to add (11 characters maximum). Then press **RETURN**.
4. Type a form description (70 characters maximum).
5. Press **ADD/UPDATE** to save your entry. The following message appears:

Is *name* a screen (yes) or an external function (no)?

6. Type **yes** and press **RETURN**.

ACCELL/Generator begins execution, and the Form Definition form appears.

7. Press **ADD/UPDATE** to save the form definition.
8. Press **PREVIOUS FORM**. A blank form template appears.
9. Press **ADD/UPDATE**. to save the blank form.
10. Create your form by following the instructions given in *ACCELL/SQL: Creating Screen Forms*.
Or, if you do not want to design your form now, press **PREVIOUS FORM** to return to the List of Forms form.

After you have defined your form, return to ACCELL/Environment to define another form or to build your application. For instructions about how to build your application, see “Building and Testing the Application” beginning on page 91.

Displaying Form Information

Detailed information about your forms is automatically maintained by ACCELL/SQL. You can view this information and add comments by using the Form Information form.

The following illustration shows an example of the Form Information form.

Form Information Form

FORM INFORMATION	
Form File Name	: /usr/accelltut/aclenv/tutor
Time of Creation	: Thu Jul 3 13:49:44 1986
Time of Last Modification	: Mon May 11 15:34:22 1987
Size of File in Bytes	: 1026
4GL Script File Name	: /usr/accelltut/aclenv/tutor
Time of Creation	: Thu Jul 3 13:49:44 1986
Time of Last Modification	: Mon May 11 15:34:22 1987
Size of File in Bytes	: 1364
Database:.....	: PUBLIC
Description:	

The Fields of the Form Information Form

The fields of the Form Information form display detailed information about the current form. You can view current information, and for some fields you can change the information that is displayed.

Form File Information

The Form Information form displays the following information about the screen form file:

Form File Name Displays the name of the form file. You can change the name of the file by using the ACCELL/SQL field-editing commands.

Time of Creation (Display-only field) Displays the date and time that the form was first defined.

Time of Last Modification (Display-only field) Displays the date and time of the last change made to the form.

Size of File in Bytes (Display-only field) Displays the size of the form file.

Form Script Information

The Form Information form displays the following information about the form script associated with screen form:

4GL Script File Name Displays the name of the ACCELL/4GL form script file. You can change the name of the file by using the ACCELL/SQL field-editing commands.

Time of Creation (Display-only field) Displays the date and time that the form script file was created.

Time of Last Modification (Display-only field) Displays the date and time of the last change made to the form script.

Size of File in Bytes (Display-only field) Displays the size of the form script file.

Database Displays the default database name assigned by the RDBMS. If you have been granted the required RDBMS privileges, you can change the database name by using the ACCELL/SQL field-editing commands.

Description Displays your comments about the form. You can add or change information in this field by using the ACCELL/SQL field-editing commands. You can enter up to five lines of descriptive information (50 characters per line).

Displaying or Changing Form Information

To display information about an application form, complete these steps:

1. From the Current Application form, press **NEXT FORM**. The List of Forms form appears.
2. Select the application form for which you need information.
3. Press **ZOOM**. The Form Information form appears. View or change information as needed.
4. If you have made changes, press **ADD/UPDATE** to save your changes.
5. To return to the List of Forms form, press **PREVIOUS FORM**.

Changing the List of Forms Description

You can change the form description displayed on the List of Forms form. To change the description of your form, complete these steps:

1. From the Current Application form, press **NEXT FORM**. The List of Forms form appears.
2. Position the cursor on the appropriate form name on the List of Forms form. Press **RETURN**.
3. Type a new description over the existing description.
4. Press **ADD/UPDATE** to save your entry.
5. To return to the List of Forms form, press **PREVIOUS FORM**.

For information about how to change the specifications for a form, such as file names, see “Displaying or Changing Form Information” on page 80.

Deleting a Form



Warning

You cannot restore a form after it has been deleted. The form description, the screen form layout, and the associated ACCELL/4GL form script are all permanently deleted from the application when you delete a form from the List of Forms form. ■

To delete a form, complete these steps:

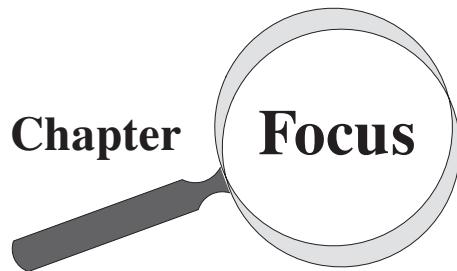
1. From the Current Application form, press **NEXT FORM**. The List of Forms form appears.
2. Position the cursor on the appropriate form name on the List of Forms form.
3. Press **DELETE RECORD**. The following prompt appears:

Delete the form (yes/no)?

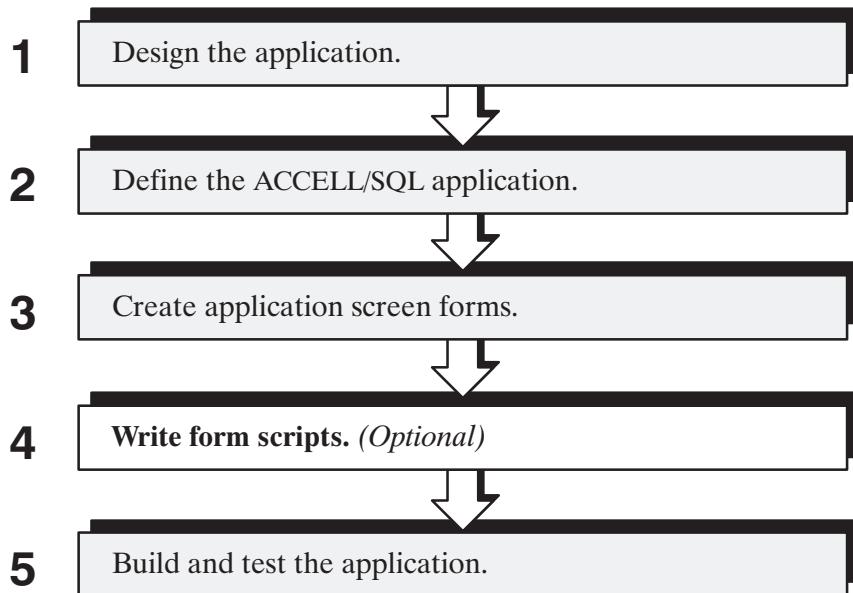
4. To confirm that you want to delete the selected form and its script, type **yes**. The form is deleted from the List of Forms form.

If you want to abort the delete operation, type **no**.

Creating Form Scripts



This chapter describes step 4 of the application development process.



Form scripts are an optional component of your application. This chapter provides an introduction to form scripts:

- form script features
- using scripts to control application execution
- creating a script file

What Is a Form Script?

A form script is an ASCII text file that contains ACCELL/4GL statements. These ACCELL/4GL statements control the events and information that occur on an application screen form. Each screen form in your application can have a corresponding ACCELL/4GL form script. Form scripts are optional.

You can also use ACCELL/4GL scripts to define global functions or to execute C functions.

The ACCELL/4GL language provides many features, for example:

- operators and expressions
- event sections
- transaction control statements
- flow control statements
- user command definition
- function definition
- error-handling
- global functions
- array processing
- ZoomView
- SQL statement execution

To create a form script, follow the instructions given in *ACCELL/SQL: Writing Form Scripts*.



Additional Help

For complete syntax descriptions and examples of all ACCELL/4GL statements, see *ACCELL/SQL: Script and Function Reference*. ▀

Controlling Application Execution

The execution of your application is controlled by ACCELL/Manager. The execution sequence is determined by the information specified in ACCELL/Generator for the screen form, by the ACCELL/4GL form scripts, and by commands entered by the user at runtime.

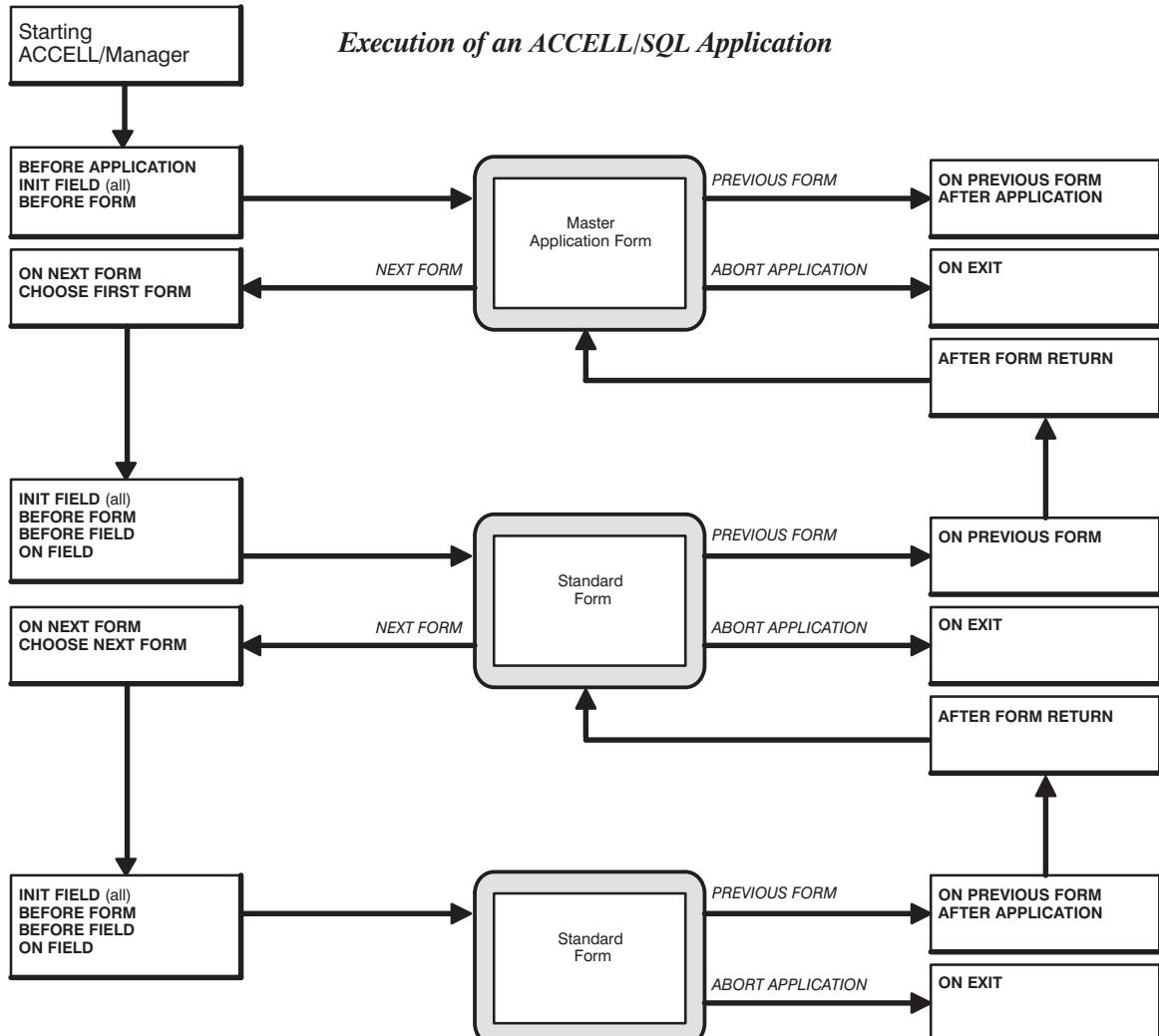
By default, if no form script exists for a form, ACCELL/Manager executes default actions each time the user executes a command. You can customize these actions by creating a form script for each screen form.

The following illustration shows an example of how form scripts, user commands, and screen forms all interact at runtime. To design your form scripts, you must understand how an application is executed and how it is affected by the form script.



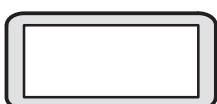
Additional Help

For detailed explanations of runtime execution and the interaction of application components, read *ACCELL/SQL: Writing Form Scripts*. ■



Legend

Description



The current screen form, defined in ACCELL/Generator.



ACCELL/4GL statements contained in a form script.



The ACCELL/Manager command executed by the user.

Creating a Script File

To create a form script file, you can use any one of these methods:

- from ACCELL/Environment
- from within ACCELL/Generator
- from the operating system command line



Tip

Do not attempt to create a complete script all at once. Instead, create a small, basic script; compile and test the script until you are satisfied with it. Then add more enhancements, compiling and testing your script after each change. ■

Creating a Script in ACCELL/ Environment

To create a form script, complete the following steps:

1. Create a screen form, as described in the previous chapter, “Creating Application Screen Forms.”
2. From the List of Forms form in ACCELL/Environment, position the cursor the screen form name.
3. Press **NEXT FORM**. The Operations menu appears.
4. From the Operations menu, select option 2, “Edit ACCELL/4GL Script.” A file having the current form name is opened by the system editor.

If you are editing the master application form script, the file name suffix is **.as**; if you are editing a standard form script, the file name suffix is **.fs**.

5. Create the form script as described in *ACCELL/SQL: Writing Form Scripts*. You simply use the editing commands provided by your system file-editing program.
6. Save and close your script file. The Operations menu then reappears.
7. Compile and integrate your form script. See “Building and Testing the Application” beginning on page 91.

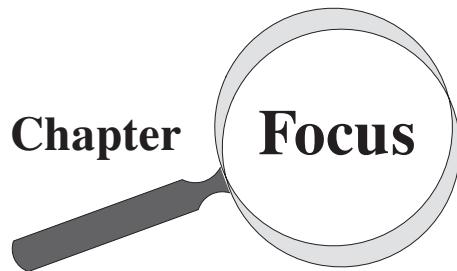
Creating a Script in ACCELL/ Generator

To create a form script file from within ACCELL/Generator, first display your screen form in the form editor. Then press **EDIT FILE**. If a form script already exists, it appears on the screen; if the form script does not exist, it is created from the default template. The file is opened in your default system editor (for example, **vi**).

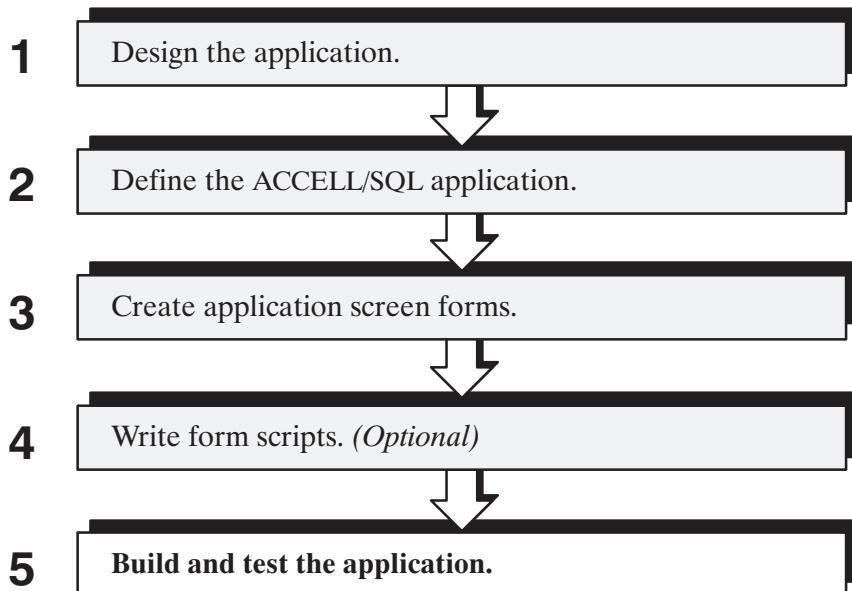
Creating a Script File From the Operating System

To create a script from the operating system command line, invoke your standard editing program (for example, **vi**). For a standard script file, specify the file name as the form name with the suffix **.fs**, for example, **userform.fs**. For a master application script file, specify the file name as the form name with the suffix **.as**, for example, **master.as**.

Building and Testing the Application



This chapter describes step 5 of the application development process.



This chapter describes how to build your application and includes guidelines for testing it:

- building an application
- using the Operations menu
- using utilities
- testing the application

Building an Application

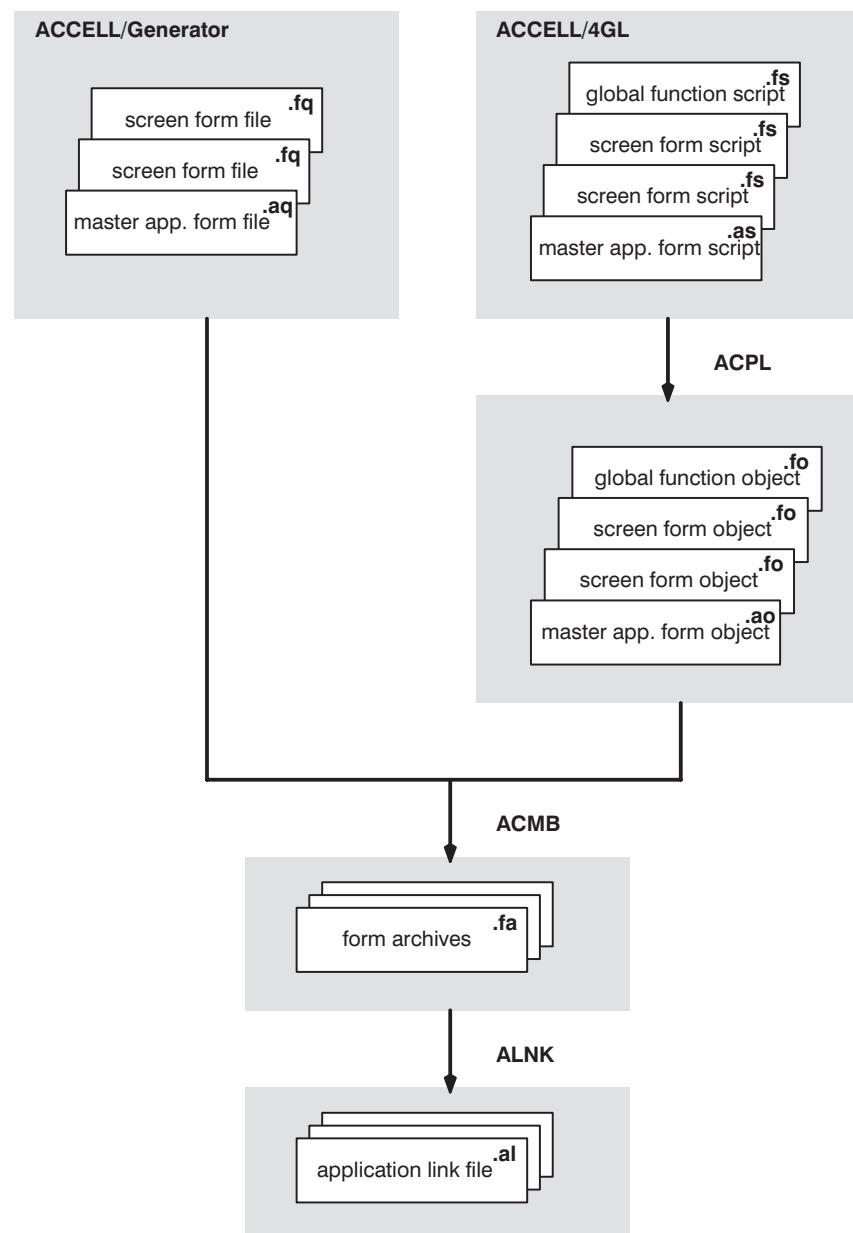
To build your application, the screen form files and form script files, as well as help files and functions, must be compiled, combined, and integrated.

The following files are used to create the application run-time executable file:

form files	Contain screen form formats and definitions created in ACCELL/Generator: <i>application.aq</i> master application form <i>form_name.fq</i> standard form
script files	Contain ACCELL/4GL statements: <i>application.as</i> master form script <i>form_name.fs</i> standard form script <i>function.fs</i> global function
object files	Files created by the ACCELL/SQL compiler (ACPL) from the <i>.fs</i> and <i>.as</i> script files: <i>application.ao</i> master form script <i>form_name.fo</i> standard form script <i>function.fo</i> global function
archive file	Image files created by the ACCELL/SQL combiner/archiver (ACMB) from the <i>.aq</i> , <i>.fq</i> , <i>.ao</i> , and <i>.fo</i> files: <i>application.fa</i> form archive
link file	Application map produced by the ACCELL/SQL linker (ALNK). <i>archive_name.al</i> application link file

This diagram illustrates how these files are used to build a completed application.

Building the Application



Default File Names

When you use ACCELL/Environment menu options to integrate your application, you are implicitly indicating that all files being integrated or created have the default file name suffixes:

File Type	File Name Suffix
Standard form script files	.fs
Master application form script files	.as
Standard form files	.fq
Master application form files	.aq
Form archive created by the combiner	.fa
Application link file created by the linker	.al

You can specify different file suffixes by using the ACCELL/SQL development utilities rather than ACCELL/Environment to create your application files.



Additional Help

For a complete list of ACCELL/SQL file types, see *ACCELL/SQL: Managing an Application*. ■

Form Script Integration

Compiling and integrating an ACCELL/4GL form script is a three-step process:

1. Compile the form script file with the ACCELL/SQL compiler.
2. Combine the form script object file and the ACCELL/SQL form file into a form archive.
3. Link the application archives to create an executable application link file.

You can compile and integrate scripts in any of three ways:

- From ACCELL/Environment, you can perform all three steps by selecting either the “Compile/Integrate 4GL & Forms” or the “Compile/Integrate/Run Application” option from the Operations menu. (See “Using the Operations Menu” on page 97.)
- From the operating system, you can perform each step by executing the appropriate ACCELL/SQL commands: **ACPL** for the compiler, **ACMB** for the combiner, and **ALNK** for the linker. (See “Using the ACCELL/SQL Integration Utilities From the Command Line” on page 100.)
- From the UNIX operating system, you can also create a **makefile** with the ACCELL/SQL utility **makeamake**.

The **makefile** keeps track of the dependencies between the application form and script files. The **makefile** lists the compilation steps that must be performed when a given file in the application changes. You can then perform only the needed compile steps by executing the **make** command. (See “Using a **makefile**” on page 101.)

Using the Operations Menu

From ACCELL/Environment, you can compile an ACCELL/4GL form script by choosing an option on the Operations menu.

On the Operations menu, “Compile/Integrate Forms & 4GL” is option 3, and “Compile/Integrate/Run Application” is option 5. Either option compiles and integrates your forms and ACCELL/4GL form scripts.

Compile/Integrate Forms & 4GL

When you select the “Compile/Integrate Forms & 4GL” option, these operations are performed automatically:

1. The ACCELL/SQL compiler compiles the form script.
2. The ACCELL/SQL combiner combines the script and its associated form into a form archive.
3. The ACCELL/SQL linker links the application files.

To run the compiled and integrated application, select option 4, “Run Application,” from the Operations menu.

**Tip**

Use the “Compile/Integrate Forms & 4GL” option when you are trying to resolve compilation errors in an ACCELL/4GL form script. ■

Compile/Integrate/Run Application

When you select the “Compile/Integrate/Run Application” option, these operations are performed automatically:

- The ACCELL/SQL compiler compiles the form scripts.
- The ACCELL/SQL combiner combines each script and its associated form into a form archive.
- The ACCELL/SQL linker links the application files.
- ACCELL/Manager begins execution of the application.

**Tip**

Use the “Compile/Integrate/Run Application” option when you have resolved all compilation errors but have made a small change to an ACCELL/4GL form script. ■

Integrating Files for Listed Forms

To integrate files associated with a form that is listed on the List of Forms form, complete the following steps:

1. From the List of Forms form, select a form.
2. Press **NEXT FORM**. The Operations menu appears.
3. From the Operations menu, select option 3 or 5. The following message appears:
Is name a screen (yes) or an external function (no)?
4. Type **no** and press **RETURN**. The ACCELL/4GL form script associated with the form that you selected on the List of Forms form is compiled, combined, and linked.

If integration is successful, you can now test the application.

Integrating Files for Unlisted Forms

To integrate files associated with a form that is not listed on the List of Forms form, complete the following steps:

1. From the List of Forms form, press **CLEAR TO ADD**.
2. Type the form name and description.
3. Press **ADD/UPDATE** to save your addition to the List of Forms form. (If the form name you specified already exists, an error message appears; press **RETURN** and specify a different name.) ACCELL/Generator displays the form editor screen.
4. Define the form in ACCELL/Generator, as described in *ACCELL/SQL: Creating Screen Forms*.
5. To save the form and exit ACCELL/Generator, press **ADD/UPDATE**. The List of Forms form is displayed again.
6. Press **NEXT FORM**. The Operations menu reappears.
7. From the Operations menu, select option 3 or 5. The following message appears:
Is name a screen (yes) or an external function (no)?
8. Type **no** and press **RETURN**. The ACCELL/4GL form script associated with the form is compiled, combined, and linked.

Integration Errors

If an error occurs while compiling, combining, or linking files, error messages are displayed in a pop-up form. If serious errors occur during compilation, the compiler copies the statements compiled until the error occurrence to a file named *form_script.io*.

The *form_script.io* file is ordinarily used to temporarily store the preprocessor output for the form script being compiled. By default, if no errors occur during compilation, the *form_script.io* file is removed after compilation is completed.



Additional Help

For information about file compilation, see the **ACPL** utility description given in *ACCELL/SQL: Configuration Variable and Utility Reference*. ■

Using the ACCELL/SQL Integration Utilities From the Command Line

If your application file names do not have the default file name suffixes, you must compile and integrate the files by running the ACCELL/SQL integration utilities from the operating system command line.

Compiling and Integrating Application Files

When compiling and integrating ACCELL/SQL application files, complete these steps:

1. Make sure that the current directory contains the application files. Usually, your application screen forms, form scripts, and other files reside in a single directory.

In the default directory structure, the application directory has the same name as the application and is a subdirectory of the directory specified in the *ACLENV* configuration variable.

2. If your application contains both form script files and form files, compile the master application form script and standard form scripts by running the **ACPL** utility.

ACPL performs these tasks:

- Calls the preprocessor, which is usually the default ACCELL/SQL preprocessor, **ucpp**.
- Compiles the ACCELL/4GL statements that appear in the form script file by checking each statement's syntax.
- Produces an object file that contains the compiled ACCELL/4GL statements.

3. Create the form archives by running the **ACMB** utility.

ACMB combines the form file and the form script object file to create an entry in the form archive file.

4. Link the application files by running the **ALNK** utility.

ALNK creates an application link file that contains information about the application's forms and the form archives in which the forms are stored. (ACCELL/Manager uses the application link file at runtime to access application forms.)



Tip

If you change your database design after your application has been integrated, you can ensure that your form files are concurrent with the database design by running the **q2a2q** utility. ■



Additional Help

For detailed information about **ACPL**, **ACMB**, and **ALNK**, and other utilities, see *ACCELL/SQL: Configuration Variable and Utility Reference*. ■

Using a makefile (UNIX only)

You can use a **makefile** to keep track of the tasks that must be performed whenever you change a form or a form script file.



Dependencies

The features described in this subsection are available for the UNIX operating system environment only. ■

The **makefile** must perform the tasks outlined below.

After changing
this type of file:

Master application
form script

Standard form
script

You must perform these tasks:

1. Compile the form script file by running **ACPL** with the **-a** option
2. Recombine the script object file and the associated form file into the form archive by calling **ACMB** with the **-a** option
3. Relink the application files by running **ALNK**

1. Compile the form script file by running **ACPL**
2. Recombine the form script object file and the associated form file into the form archive by running **ACMB**

3. Relink the application files by running **ALNK**

(continued on next page)

After changing this type of file:	You must perform these tasks:
Master application form	<ol style="list-style-type: none"> 1. Recombine the form file and the associated form script object file into the form archive by running ACMB with the -a option 2. Relink the application files by running ALNK
Standard form	<ol style="list-style-type: none"> 1. Recombine the form file and the associated form script object file into the form archive by running ACMB 2. Relink the application files by running ALNK

The **makefile**, **make**, and **makeamake**

You can use a **makefile** and the operating system **make** utility to let ACCELL/SQL know which files to compile, combine, and link. The **make** utility reads the **makefile** file to determine which files need to be reprocessed (compiled, combined, and linked) when a form or form script file is changed. The **makefile** contains the list of commands that are needed to reprocess the changed files.

Because the syntax of the **makefile** is complex, ACCELL/SQL provides the **makeamake** utility to save you from having to create your own **makefile**. The **makeamake** utility creates a **makefile** that contains the ACCELL/SQL commands to compile (**ACPL**), and combine (**ACMB**), and link the application (**ALNK**).

Generating a makefile

To use a **makefile**, all source file must be located in the current directory and contained in a single form archive.

When generating a **makefile**, you perform these steps:

1. Change to the application directory where you want to generate a **makefile**.

This directory is the directory that contains your form and script files, and is usually a subdirectory of the directory specified in the *ACLENV* configuration variable.

2. Remove any **makefile** that is in the application directory.
3. Run **makeamake** to generate a new **makefile** for your application.

Reexecute the **makeamake** utility after you create your application forms and form scripts or when you add or delete forms and form scripts.

Running **makeamake** ensures that your **makefile** is up to date.



Additional Help

For complete information about **makeamake** utility syntax and usage, see *ACCELL/SQL: Configuration Variable and Utility Reference*. □

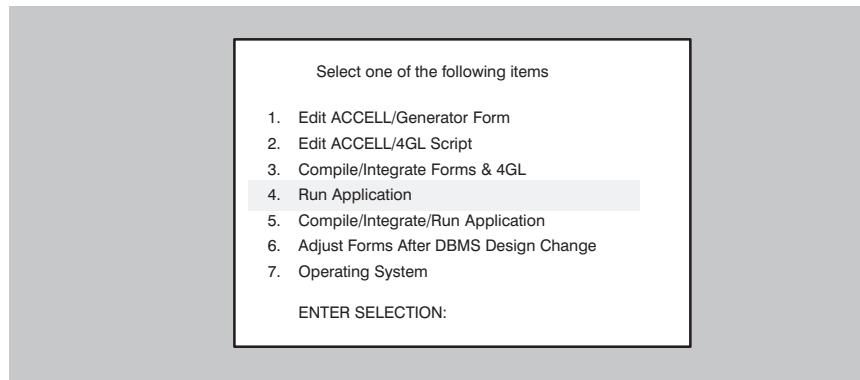
Using make to Compile and Integrate the Application

After the **makefile** has been created, you can run the operating system **make** utility to compile, combine, and link the application files. The **make** utility uses the **makefile** to determine whether any files have been changed since the previous file integration. Then **make** automatically runs the appropriate integration steps for the files that have been changed.

Testing Your Application

Testing your application requires that you execute the application and experiment with all its features. Test each part of the application as you create it; then test the completed application also.

To execute your application, select option 4, “Run Application,” from the Operations menu. Then experiment with all the user commands and operations described in *ACCELL/SQL: Using an Application*.



User Interface

To test your application, you must execute all operations you intend end users to be able to perform, for example:

- find a record
- add a new record
- delete an existing record
- change an existing record
- experiment with scrolling, editing, help, and other commands

In addition to testing normal operations, test incorrect operations also, such as invalid values, prohibited operations, disabled function keys, and so on. When an error occurs, verify that the error message provides appropriate information to recover from the error.

Demonstrate your forms to end users and solicit their suggestions. If possible, perform usability testing with typical users.

Based on the results of your testing, revise your screens, error messages, help forms, or documentation as needed.

Debugging

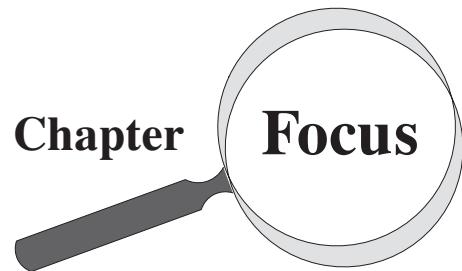
To resolve errors or problems within ACCELL/4GL scripts, you can use an optional component, the ACCELL/SQL Interactive Debugger. The Debugger enables you to display the form script and variable values while the application is running.



Additional Help

For information about how to debug form scripts, see *ACCELL/SQL Interactive Debugger: Developer's Reference*. □

Implementing the Application



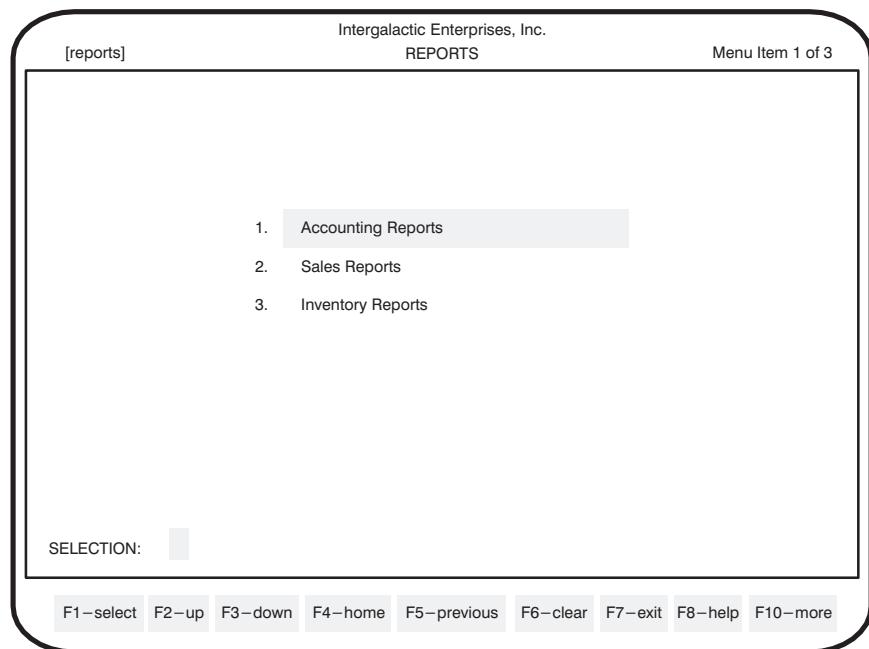
This chapter describes additional features you can add to your application to prepare it for the end user:

- menus
- reports
- online help
- user commands
- desktop icons (GUI only)

Creating User Menus

The Menu Handler component enables you to create menus that are tailored for each user. For example, you can create a menu that gives a group of users access only to the applications that correspond to their needs.

The following illustration shows an example of an application menu.



Additional Help

For complete information about how to create menus with Menu Handler, see *ACCELL/SQL: Localizing an Application*. ■

Creating User Reports

Users often need periodic reports formatted in tabular columns and printed on paper. ACCELL/SQL provides an easy method for designing and generating user reports – ACCELL/Report Writer.

ACCELL/Report Writer is a report generator. Reports can be generated with data from a variety of sources, including SQL queries and ASCII files. ACCELL/Report Writer uses a nonprocedural, English-like language for formatting the data.

The following illustration shows an example of a simple report. Complete information about how to create report with Report Writer is in *ACCELL/SQL: Creating Reports With RPT Report Writer*

Sample Report

SALES REPORT		
STATE: CA		
CITY: Los Angeles		
CUSTOMERS		
-----	ORDER #	AMOUNT
ABC Company, Inc.	98475 423485	\$54,321.99 \$238.67 ----- \$54,560.66
Mom's Auto Repair, Inc.	348661 78563222 123456789	\$98,342.59 \$23,586.89 \$55,676.50 ----- \$177,605.98
SALES: Los Angeles		\$232,166.64

CITY: San Jose		
CUSTOMERS		
-----	ORDER #	AMOUNT
Fixit-Yourself Company	385576 18496333	\$12,887.50 \$239.00 ----- \$13,126.50
⋮		
SALES: NY		\$178,385.43

TOTAL SALES THIS REPORT:		\$1,003,347.73
AVERAGE CUSTOMER ORDER :		\$13,030.49
=====		

Customizing Online Help

ACCELL/SQL error messages and your help forms can be customized for a particular installation, user, or language.

- For example, error number –8864 contains the following text:

All records in the selected set are locked by another user.

You can change this message as desired, for example:

Another user is updating these records. Please try again later.

- To change help forms, you can edit them with the form editor in ACCELL/Generator, or you can use the **PAINTHLP** utility. For information about this utility, see *ACCELL/SQL: Configuration Variable and Utility Reference*.



Additional Help

For complete information about how to customize error messages and help forms, see *ACCELL/SQL: Localizing an Application*. ■

Customizing User Commands

By default, ACCELL/SQL provides a set of commands for performing user operations on forms. However, you can customize these commands or create your own commands for these features:

- ACCELL/Manager commands
- developer-defined commands
- application execution

ACCELL/ Manager Commands

ACCELL/SQL provides a set of default commands, as defined in the **unicap** file. However, ACCELL/Manager commands can be customized, renamed, enabled and disabled for particular users or for different modes. Function key labels can also be customized. To customize the ACCELL/Manager commands for a character mode application, you simply edit the user's **unicap** file. To customize commands for a graphical presentation mode application, you must customize the appropriate resource or preference files.



Additional Help

<i>About</i>	<i>See</i>
Customization of commands in the unicap file	<i>ACCELL/SQL: Setting Up a User Environment</i>
Customization of commands for a graphical user interface	<i>ACCELL/SQL: Developing an Application for a Graphical User Interface</i>

Developer- Defined Commands

You can create your own commands for any of your form screens by including a **DEFINE COMMAND** section in the form script. For example, you could define a command to read the user's incoming electronic mail or to print a report.



Additional Help

For a detailed description of the **DEFINE COMMAND** section, see *ACCELL/SQL: Script and Function Reference*. ■

Application Execution Commands

To execute a completed application, by default you use the **AMGR** command on the operating system command line, for example:

AMGR tutorial

To simplify application execution for the end user, you can create command procedures or scripts that automatically execute the **AMGR** command.

Documenting the Application

During application design, you have specified the forms and other components of the application. Especially for a large application, it is important to retain complete and accurate records of the application design. When you need to enhance or upgrade the application, these records are important tools. The system administrator also needs access to application documentation for maintaining the application.

Most applications require three types of application documentation:

- technical documentation
- administrator documentation
- user documentation

Technical Documentation

As with any software project, you will generally need documentation that describes the application in detail. For example, for each form, you need a record of the associated database table, its purpose, a list of fields, and so on.

Also consider the need for the following types of documentation:

- application flow diagram
- database specifications
- error numbers and messages
- known deficiencies
- project history
- enhancements requests

To obtain information about any application form, you can use the **FRMDOC** utility. This utility displays field definitions and a diagram of the screen layout.



Additional Help

For information about how to use the **FRMDOC** utility, see *ACCELL/SQL: Configuration Variable and Utility Reference*. ■

Administrator Documentation

When an application has been completed and is ready for a production environment, the system administrator requires instructions for maintaining the application. In addition to the standard ACCELL/SQL documentation set, the administrator needs specific information about the application.

In your administrator documentation, include procedures for all tasks related to running the application, for example:

- system backups
- adding or deleting users
- changing privileges
- error recovery
- recovery from computer failure
- allocating memory and disk space

The developer documentation may also be needed by the administrator. In particular, the administrator needs file system information, for example:

- application directory
- required files

Some administrator documentation can be stored online. However, in the case of a system failure, the administrator will need printed documentation containing recovery procedures.



Tip

Provide a system log for the administrator to use. Include troubleshooting tips and the telephone number for customer support. Use the log to diagnose and correct recurring problems. ■



Additional Help

For general administrative information, see *ACCELL/SQL: Managing an Application*. ■

User Documentation

Depending on the purpose of your application and its complexity, users will need varying amounts of documentation. Generally, user documentation contains these types of helpful information:

- login and logout instructions
- application map
- task flow
- error message explanations
- procedures, such as how to find, add, or delete information
- commands and keyboard map
- quick reference card
- cancelling an operation
- how to obtain assistance

User documentation provides instructions in how to use the application. It does not usually describe the internal design of the software.



Tip

In user documentation, use terminology familiar to the user, such as the terminology used in their industry or specialty (medical, accounting, transportation, and so on). Avoid database jargon and unnecessary explanations. Give the user step-by-step instructions for accomplishing familiar business tasks. ■



Additional Help

As a guide for designing your own user documentation, see *ACCELL/SQL: Using an Application*. ■

Configuring the Application

After you have developed and tested your application on your host computer, you are ready to configure the application for a production environment. Setting up your application for end users is dependent on these factors:

- production environment
- computer system
- user interface

Setting Up the Production Environment

The production environment must be configured for the user rather than for an application developer. For instance, users do not need to use the development tools or experimental database tables that are used by the application developer. To configure your application for end users, consider these issues:

- directory structure
- privileges, permissions, and security
- language
- search metacharacters
- database tables and views



Additional Help

For information about how to configure the user environment, see *ACCELL/SQL: Managing an Application*. ■

Moving the Application to Another Computer System



If you have developed the application on a host computer that is different from the users' computer, you can move the application to another computer by using ACCELL/SQL utilities. To move the application, you need to set up appropriate directories and configuration variables.

Additional Help

<i>About</i>	<i>See</i>
Deleting, moving, or renaming an application	<i>ACCELL/SQL: Managing an Application</i>
Moving a Windows application	<i>ACCELL/SQL: Developing an Application for Windows</i>

Adapting the Application to the User Interface

Configuration of the application must be customized for the user interface. ACCELL/SQL applications can be executed from many types of hardware systems and user interfaces, for example:

- ASCII terminals
- personal computer
- Windows
- OPEN LOOK
- Motif

For graphical user interfaces, ACCELL/SQL provides additional features for customizing your application, for example:

- scroll bars
- menu bars
- color
- video attributes
- command buttons



Additional Help

For complete information about GUI features, see *ACCELL/SQL: Developing an Application for a Graphical User Interface*. □

Glossary

ACCELL/4GL

The ACCELL/SQL fourth-generation language used to combine painted forms with additional flow of control logic and other application language features.

ACCELL/Environment

The ACCELL/SQL menu-driven facility for creating and modifying forms and form scripts, and compiling and integrating applications.

ACCELL/Generator

An applications generator used to draw forms, to establish field attributes, and to define the order of execution for forms.

ACCELL/Manager

The ACCELL/SQL runtime module for the completed application forms and ACCELL/4GL files. ACCELL/Manager displays the appropriate application forms, executes the ACCELL/4GL scripts, accesses the database, and interacts with the end-user.

application

A software solution to a particular real-world problem. An ACCELL/SQL application is a set of forms designed to resolve the problem, such as prospect tracking or order entry.

ASCII terminal

A data communication device equipped with a keyboard and display monitor that is capable of sending and receiving ASCII characters. On microcomputers, workstations, or personal computers, a terminal emulation program can be used to simulate an ASCII terminal.

Boyce-Codd normal form (BCNF)

A table in which every determinant is a candidate key.

CBT

Computer-based training.

configuration variable

A variable that specifies an aspect of the application development or runtime environment, for example, the size in bytes of the memory used to stored form and function information.

data type

The formats in which ACCELL/SQL displays or stores data.

When ACCELL/SQL processes a form, the information is kept in the ACCELL/SQL data type. Information transferred from ACCELL/SQL to the database is converted to the

corresponding RDBMS data type. Each database type has a specific internal storage format.

ACCELL/SQL provides the following data types:

AMOUNT	NUMERIC
BINARY	STRING
BOOLEAN	TEXT
DATE	TIME
FLOAT	

form field

ACCELL/SQL applications use two kinds of fields: *screen fields* and *target fields*.

ACCELL/SQL distinguishes between a database column and a screen field. *Column* refers to the actual database component, and *field* refers to a database column being used in an ACCELL/SQL application.

form script

An ASCII text file that contains ACCELL/4GL event sections statements. A form script is associated with a screen form or a global function.

format template

A string of symbols that represent the type of character to be printed for each symbol position. Symbols represent digits, currency marks, positive/negative signs, and so on.

GUI

Graphical user interface.

localization

The process of adapting an application to the local language or dialect. Data display formats can also be customized according to local preferences.

menu

A list of choices for you to choose from.

open systems

Software systems that are compatible with a variety of computer hardware configurations, operating systems, and user interfaces.

RDBMS

Relational Database Management System.

record

The ACCELL/SQL equivalent of a database *row*.

ACCELL/SQL distinguishes between a row and a record. *Row* refers to the actual database component, and *record* refers to a database row that is being used in an ACCELL/SQL application. *See also row; form field*.

row

A unique group of related items in a database table, such as first name, last name, sales office, and phone number. A row includes an entry for each column in the database table. *See also record*.

RPT

The report processor used with ACCELL/SQL to generate application reports.

screen form

An area on the terminal screen that displays related headings and database information. Forms are created in ACCELL/Generator and may optionally have ACCELL/4GL form scripts associated with them.

ACCELL/SQL provides six types of forms:

- master application
- standard
- multi-occurrence
- zoom
- help
- error

terminal emulator

A software program that enables a microcomputer, workstation, or personal computer to send and receive data as if it were an ASCII terminal.

third normal form

A table in which all of the nonkey columns are fully dependent on the primary key and all the nonkey columns are mutually independent.

user

Any person who uses ACCELL/Manager to run a completed ACCELL/SQL application.

utility

A program that performs a specific task, such as application linkage or file conversion, and that can be executed by typing the utility name and arguments at the operating system command line.

